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JOURNAL

OF THE ROYAL STATISTICAL SOCIETY.

DECEMBER, 1912.

STILL-BIRTHS *in* RELATION *to* INFANTILE MORTALITY.

By REGINALD DUDFIELD, M.A., M.B.

[Read before the Royal Statistical Society, November 19, 1912, the President, Professor F. Y. EDGEWORTH, M.A., F.B.A., in the Chair.]

I HAVE been asked by the Council to open a discussion of the Report on "Infantile Mortality" prepared by the Special Committee of the Council, which was published at the beginning of last August. Before doing so, it may be useful to give some account of the inception of the inquiry.

At the end of 1910 I was looking into the question of infantile mortality as observed in this and certain other European countries. I found that an attempt to institute comparisons was rendered abortive by reason of the differences in practice both as regards what was included under the term still-birth, and as regards the data used for the calculation of rates of mortality. As an example, I may quote the practice prevailing in France, the first instance brought to my notice. There, three days are allowed for the declaration of a birth, and any child "presented" to the mayor (the registration officer) dead is entered as "still-born" (*mort-né*), regardless of the possibility of the child having been born alive but dying before presentation. As a matter of fact, a fair proportion of the children "presented dead" are born alive. It is evident that rates of infantile mortality based on the deaths among children "presented alive" only—as is done in France—cannot be compared with rates based on the deaths among all children born alive.¹

An examination of the writings of the late Dr. Bertillon, and more particularly his article, "*Mort-né*," in the *Dictionnaire*

¹ I have been informed quite recently that in certain of the States within the Union (N. America) the deaths of children aged under one week are excluded from the data used in calculating infantile mortality rates. I have not had time to verify that statement, but I have no reason to doubt the accuracy of my informant.

Encyclopédique des Sciences médicales, made it quite clear that careful inquiry was necessary to determine what data were taken into account in calculations of infantile mortality in the different countries before any useful comparison of such rates could be made. The case was submitted to the Executive Committee of our Council, and a suggestion was made that such an inquiry should be undertaken by the Society. The Executive Committee approved the suggestion, and recommended the Council to cause the inquiry to be made. In March of last year the Council appointed a Special Committee, consisting of the following Fellows²:—

Timothy A. Coghlan, I.S.O.
 Reginald Dudfield, M.A., M.B.
 Sir William C. Dunbar, Bart., C.B.
 Noel A. Humphreys, I.S.O.
 Sir Shirley F. Murphy, F.R.C.S.
 C. P. Sanger, M.A.
 T. H. C. Stevenson, M.D.

The Reference to the Committee was in the following terms:—

“ To inquire into the systems adopted in different countries for
 “ the registration of births (including still-births) and deaths
 “ with reference to infantile mortality, and to report to the
 “ Council.”

An Inquiry Form—a copy of which will be found appended to the Report of the Committee³—was prepared and forwarded to the principal statistical officers of 136 countries and states. Replies were received from 103 officers of states and countries, and from 3 officers of central statistical bureaus, viz.:—The Census Office of the Dominion of Canada, the Imperial Statistical Bureau of the German Empire, and the Census Office of the United States of America. The replies received have been tabulated in groups, according to the subject, and will be found in Tables A—E (and the Notes appended thereto) of the Report.⁴ The subjects covered by those tables are:—

- (1) The practice of registration of births and deaths generally—
Table A ;
- (2) The efficiency of registration—Table B ;
- (3) Registration of still-births—Table C ;
- (4) Definition of still-birth—Table D ; and
- (5) Methods of calculating rates of natality and mortality—
Table E.

² Mr. Coghlan and Mr. Humphreys were unfortunately unable to attend the concluding meetings of the Committee, and to that cause is due the absence of their signatures from the Report.

³ See p. 78 of this issue.

⁴ See pp. 46 *et seq.* of this issue.

It is evident from the above scheme that the scope of the Inquiry was extended considerably beyond the limits originally proposed. Such extension was principally brought about by suggestions made to the Committee while the Inquiry Form was being drafted. The results obtained are such, I venture to think, as to justify the extension. Similar information, on a much more limited scale, is to be found in the volumes of *Statistique Internationale du Mouvement de la Population* issued by the *Ministère du Travail et de la Prévoyance Sociale* (*Direction du Travail*) under the supervision of Mons. Lucien March. That is the only compilation of an international character that the Committee has been able to trace, but *resumés* of the practice of registration within the British Empire are to be found in the Reports of the Registrar-General.

Materials for many discussions could be drawn from the Report of the Committee, and I have limited myself to one issue only, viz., the relationship of still-births to the calculation of rates of infantile mortality. As, however, the statistical treatment of still-births cannot be successfully dealt with without a clear understanding of what the term "still-birth" connotes, the greater part of this paper must, of necessity, be devoted to a discussion of the definition of the term "still-birth." Incidentally I may observe that this very point was completely overlooked in the very interesting leading article on "The Registration of Births," which was published by *The Times* on August 20 last, following on the notice of the Committee's Report.

The contents of this paper therefore have been arranged under three heads, viz. :—

- A. Definition of "Still-birth" ;
- B. Registration of Still-births ; and
- C. Calculation of Infantile Mortality and the use of Statistics of Still-births.

Before proceeding further with the subject there is just one point on which I want to say a few words. I refer to the necessity of uniformity of data of vital statistics. Whatever may have been the original aims and intentions of those who initiated the registration of births and deaths, there can be little room for doubt that at the present time the principal function of vital statistics, the natural outcome of registration, is the examination of the causes of unnecessary and preventable wastage of life and (but not to so general an extent) of sickness. Vital statistics may, in effect, be regarded as taking the place of laboratory experiments in social physiology and pathology. If such views be accepted as correctly representing the functions of statistics, it is evident that sound

conclusions cannot be obtained unless the basic data are reliable and accurate, and the methods of calculations used by different inquirers uniform, or at least strictly comparable. With regard to the treatment of still-births that uniformity which is postulated is sadly lacking, as will become evident from the evidence collected by the Committee.

A. Definition of "Still-Birth."

It is very remarkable that the Committee were unable to discover in any of the replies received, or in any of the laws forwarded with those replies, any attempt to enact by law real definitions of "still-birth" or "still-born."⁵ It is true that Sec. 1 of Ordinance No. 1 of 1895 of Ceylon does enact that "the term 'still-birth' means a child born after the twenty-eighth week of gestation as dead, or apparently dead and not called back to life," but that provision appears to me to lack many of the essentials of a definition.

In countries where the registration of still-births is in force, the need of a definition for the purposes of registration is, in many instances, obviated by the general terms in which the registration of *births* is provided for. In those countries *all* births, irrespective of the children being alive or dead, are required to be registered. Elsewhere regulations drafted by the principal statistical, or registration, officers are in use for the guidance of those concerned with the act of registration (*inscription*). The regulations which were communicated to the Committee have been set out in full in Table D of the Report and the Notes thereto.⁶

The information supplied suggests three subjects for consideration:—

- (a) The date at which a dead fœtus is to be counted as a still-birth;
- (b) The basic test of life; and
- (c) The method by which the difficulty, arising from the practice prevailing in certain of the Latin countries, is to be obviated.

Obviously the first two can only be satisfactorily dealt with by arriving at real definitions of the terms "still-birth" and "still-born," while the last—(c)—appears to be question of tabulation. I shall, therefore, proceed at once to the consideration of a definition

⁵ In Table C a number of affirmative replies are given in the first column, indicating that those countries have legal definitions, but a reference to the "Notes" to the Table will quickly demonstrate that the so-called definitions are lacking of the principal requirements of a definition. The case of the Ceylon definition cited in the text is a fair sample of many of the definitions in force.

⁶ See pp. 36 and 66 *et seq.* of this issue.

of the term "still-birth." The difficulty due to the practice referred to in (c) will be considered in the third part of this paper.

In popular language a "still-birth" means a "birth of a dead child." When an attempt is made to express that interpretation in strictly scientific language, difficulties are at once encountered as to the connotations of the three principal words, viz., "birth," "child," and "dead." Some form of definition, or descriptive paraphrase, is needed for each of those words.

What then is to be understood by the word "child"? Is it to be applied to every product of pregnancy without regard to duration of the latter? Or should it be limited to a foetus which has attained a stage of development which will enable it to maintain an existence apart from the maternal tissues? Such questions involve points of law and medicine, as well as others having relation to the objects of registration and statistics.

"Life," according to the Law, "begins as soon as an infant is able to stir in the mother's womb" (Blackstone, 9th edition, i, p. 129). Such first movement, the "quickening," takes place in the fourth month of gestation, but the fixing of a date for the beginning of "life" does not prevent induced abortion at an earlier date, other than that justified on medical grounds, from ranking as criminal. If the registration of still-births be urged for purely legal purposes, viz., the prevention of criminal abortion, the term "child" used in the popular paraphrase of "still-birth" ought to include every product of healthy pregnancy.

The physician seeking evidence of life *in utero* is accustomed to rely most on the auscultation of the foetal heart sounds. He does so because it is not always possible to distinguish with certainty between muscular movements in the mother's body and foetal movements. Further, foetal movements may be absent for long periods of time and yet the child be alive and healthy. Under the most favourable circumstances the foetal heart sounds can be heard as early as the 15th-16th weeks of pregnancy, *i.e.*, during the latter half of the fourth month of gestation. From that time onwards the sounds can be heard, presuming the foetus to be alive, with increasing facility. It would, therefore, appear to be preferable—and, possibly, more logical—to date foetal "life" from the time when the heart sounds become audible. There is another reason for taking the heart sounds as the test which will become evident later on.

A foetus may be born alive but be incapable of independent existence. A child (or foetus) born in such a condition is not worth considering as an addition to the population, and has no interest to the statistician, except he be dealing with problems of "complete" human fertility. It is necessary, therefore, to decide after what

period of uterogestation a foetus may be expected, as a rule, to emerge in a viable condition, *i.e.* capable of independent existence. Common experience teaches that a foetus "born" before the conclusion of the fifth month of gestation rarely lives more than a few minutes; that a foetus born during the next ensuing month can be reared, but with great difficulty; but from the end of that month onwards the chance of survival steadily improves. By medical men a "child" is regarded as viable from the middle of the seventh month of pregnancy, and it is not usual to induce labour, when the life of the child is to be preserved, prior to the twenty-sixth or twenty-seventh week of gestation. It should be noted here that the Notification of Births Act does not require the birth of a dead child which takes place earlier than the twenty-eighth week of pregnancy to be notified.

It would seem, therefore, to be justifiable to limit the word "child" to the product of conception "born" not earlier than the twenty-eighth week of development.

In loose phraseology a child is "dead" when it shows no signs of life, and the next question is what physiological or other function or functions is or are to be taken as "sign(s) of life." According to present legal practice, a child is deemed to have "lived" when satisfactory proof has been adduced that the child has breathed (or cried) after birth. It is, however, well known to medical men that a child may be born "alive" but die without making any respiratory effort. Such a child can be "saved" by appropriate treatment, yet, if such treatment be not applied, either from ignorance or from deliberate intent, that child would have been, at law, born "dead." It is a cardinal principal in medicine that a person in whom the respiratory function is in abeyance can be resuscitated if the heart be acting, the chance of a successful issue to efforts to resuscitate such person depending largely on the vigour of the heart's action. It appears, therefore, that some test other than respiration should be adopted to distinguish between "live" and "dead" new-born children.

Attention has already been directed to the importance of the heart sounds as evidence of life in a foetus *in utero*. Having regard to the uncertainties and the possibilities of error attaching to the respiratory test, as detailed above, it is suggested that the persistence of the heart's action should be made the test of "live-birth," and the absence of such action, of "still-birth." There is no difficulty in the application of such a test in every-day practice. The pulsations resulting from the heart's action can be readily felt (and seen, if strong) in the umbilical cord, and they can also be felt in the artery passing along the outer side of the foot just below the ankle bone—

the pulse at the wrist in a new-born infant is too small to be felt except by a highly trained person. These tests are within the capacities of a competent midwife.

If then the words "showing no signs of life" be substituted for "dead" in the popular definition, the former words may be taken to mean that the child's heart has ceased to beat at the instant of time that the child comes under observation, *i.e.*, when it is "born." It remains then to determine when birth is complete.

The processes of labour are naturally divisible into four stages, more or less definitely demarcated. They are—

- (i.) Certain preliminary processes whereby the maternal tissues are rendered capable of passing the child out of the mother's body and the child is forced down into the pelvic cavity ;
- (ii.) The actual expression or expulsion of the child from the body of the mother ;
- (iii.) A period of (apparent) rest ; and
- (iv.) The expulsion of the after-birth.

So far as the child is concerned the third and fourth stages form no part of its birth, which is completed as soon as the whole of the child's body is outside that of the mother. Neither the severance of the umbilical cord nor the expulsion of the after-birth are essential to the child's survival.

It may, therefore, be concluded that the time at which the test to distinguish between "live-birth" and "still-birth" is to be applied is the instant at which the last part of the child's body quits the body of the mother.

The foregoing paragraphs suggest the following conclusions :—

- (1) That the term "still-birth" should be limited to the products of gestation which has lasted for not less than twenty-eight weeks ;
- (2) That a birth is "complete" at the moment when the whole of the body of the child—"body" including trunk, head and limbs—is outside the body of the mother ; and
- (3) That the crucial test of life should be continuance of the action of the child's heart.

Such conclusions enable the following definition—or paraphrase—of the term "still-birth" to be formulated :—

A "Still-born Child" means a child born after a period of gestation of not less than seven lunar months (twenty-eight weeks) whose heart has ceased to function before the whole of body (including the head and limbs) of such child has been completely extruded from the body of the mother.

"Still-birth" means the birth of a still-born child.

It is conceivable that such definitions may not be acceptable to the legal profession, and that objection may be taken to the reliance placed upon the heart's action as a test of life, lawyers being accustomed to demand proof of the child having made the effort to breathe or of having cried. Against such objection it may be urged that the suggested definitions have not been deduced for legal purposes, but for use in the ordinary practice of obstetrics—mainly by midwives—and for the guidance of those concerned with the registration of births. When the onus of making a decision between live and still-birth rests with a medical practitioner, he will doubtless use other evidence to confirm or refute the conclusions which would have been otherwise based on the proposed test. Furthermore, there is no reason why the respiratory test should not be taken into consideration when so desired. Proof of the expansion of the child's lungs by the inspiration of air can only be obtained by post-mortem examination, which is no part of a midwife's functions. Moreover, in prolonged labour a child may make a respiratory effort before the mouth is outside the body of the mother, and the child be thus "killed" before birth, *i.e.*, be still-born according to definition, and yet a respiratory act could be proved by witnesses present at the birth and by those making a post-mortem examination. Finally, it should be remembered that signs such as crying, breathing, &c., are impossible after the heart has ceased to beat, but the former may not be in evidence even when the heart is beating. Hence the heart's action ought to be taken as the test of life at the time of birth.

At this stage I should like to direct attention to the words of Mr. Justice Wright in the case of *Rex v. Pritchard* (1901). This was a case of alleged infanticide in which a question arose as to the child having had a separate existence from the mother. The Judge observed:—"The true test of separate existence in the theory of law (whatever it might be in medicine) is the answer to the question, Was the child carrying on its existence without the help of the mother's circulation? If yes, then it had separate existence; if no, it had no such separate legal existence."

The *British Medical Journal* (March 16, 1901) referred to that dictum in the following terms:—

This is an important dictum. We apprehend that it coincides exactly with medical science, but that the law has hitherto taken the same view of the matter is very much open to question. Lawyers would appear hitherto always to have understood that the child must be altogether expelled from the maternal parts before it can be considered born. This has often been criticised by writers on forensic medicine.

For example, in Woodman and Tidy's *Handybook*, the writers say: "We think the law, which requires that the child shall be entirely expelled from the mother before being considered born, is a direct encouragement to child murder. There seems, however, no doubt that this is the law, as interpreted by our judges. In the case of *R. v. Poulter* the medical evidence showed that the child had breathed, but as the witnesses would not swear that it was wholly born alive, the judge held the evidence insufficient to convict the prisoner." In *R. v. Simpson*, Gurney B. would not allow the case to proceed against the prisoner when it was stated that the lungs might have become distended by breathing during birth. Parkes B. charged the Grand Jury at the Hertford Assizes (1841) "That in cases of infanticide the law requires that the child should have come from the body of the mother." Coltman J. ruled that the jury must be satisfied that the entire body was in the world in a living state when the violence was offered to it.

I have quoted the above cases here because they were not brought to the notice of the Committee when drafting their Report. The full significance of the judge's dictum in *R. v. Pritchard* requires to be explained by someone fully acquainted with criminal law. To me it suggests the possibility of a medical man being put on his trial for causing the death of an unborn child (*i.e.*, one not completely expelled from the mother's body) by surgical interference. Moreover, it also appears to suggest that the child might be held to have been born alive, even though dead when completely expelled from the mother—which appears to be, to a layman *quâ* law, absurd.

The definition of "still-birth" which I suggested is the only part of the Report of the Committee—the Committee did not adopt the suggestion, considering it inadvisable at the present stage of the inquiry to do so—which has met with any criticism. In dealing with such criticism I must be understood to be speaking for myself and not as expressing the opinions of the Committee.

The *British Medical Journal*, in its issue of August 31, observed:

"The objection to this definition, in our opinion, is that the test of life—the acting of the heart—is not so easily applied, and would probably never be directly applied by any but skilled midwives, and could not, in the absence of breathing or movements, be checked by unprofessional onlookers. Again, would a *post-mortem* examination throw any light upon the question whether the heart has ceased acting before or immediately after birth, except indeed by inference from the appearances of the lungs? We must

- “confess that we prefer the regulation . . . of the
 “Cape of Good Hope—‘any physiological sign of life, such
 “‘as breathing, crying, movement, pulsation, or the like’—
 “which of course includes action of the heart
 “The chairman’s proposed definition adopts the earliest period
 “at which the fetus (*sic*) is generally recognised as viable, and
 “in this he is following the recommendation of the Select
 “Committee (1893). But he makes no suggestion, any
 “more than did this committee, for meeting the practical
 “difficulty—namely, that every fetus, of whatever stage,
 “would have to be examined *post-mortem* by a medical
 “practitioner, in order that an authoritative answer should
 “be given to the question: Is it under or over the limiting
 “period of twenty-eight weeks, or whatever it may be?”

In answer to the above quoted criticisms, all perfectly legitimate, I wish to submit the following observations:—

I. When “breathing, crying, movement” are present, every onlooker, no matter how unskilled, is a competent witness to prove “live-birth,” but when those signs—which I have already suggested should be regarded as “secondary”—are absent, we must fall back on the final test, *viz.*, the heart’s action, in the absence of which the other suggested signs are impossible of manifestation. Consider for a moment a typical case of a child who does not cry or move immediately after birth. The first question will be, Does it breathe? If not, the next question, and the last, is, Does the heart beat? It appears to me to be inevitable that the final test must in every case be the presence or absence of the heart’s activity. Given any of the other suggested signs, no question of the heart’s function will arise, in their absence, that function alone can be the test of life.

II. Of course such test can only be applied by the “skilled “midwife” or medical practitioner conducting the confinement. In the absence of both there will always be an element of doubt in the case of a child showing no sign of movement, breathing or crying. It is impossible, however, to devise a definition founded on a basic test, one which has to be relied upon in the absence of secondary indications within the cognisance of the most unskilled person, which will overcome this difficulty. The final test of life—whether in a new-born child or in an adult—must involve a knowledge of medical and physiological sciences which is not possessed by the uninstructed and popular world.

III. With our present knowledge there is no known test of “live-birth” which can be applied at an interval after complete birth, other than the presence of air in the lungs. Such fact,

however, does not appear to me to vitiate the test of life founded on the heart's activity, when it is remembered that the proposed test is to be applied at the instant of complete birth—not at an indefinite period after birth. When it comes to be a question of deciding whether a child (say) found dead was born alive or dead, and the "air test" is negative, no medical man can, unless there are signs indicative of intra-uterine death, give a decided answer. If he had been present at the birth of the child, he could, by the use of the suggested test, answer the question definitely one way or the other. Any court called upon to decide a question depending on proof of live- or dead-birth would have to rely upon the evidence of such medical man, and it is conceivable that his evidence might be in opposition to that given by unskilled onlookers. In such circumstances the evidence of the medical man—or even of the "skilled midwife"—would or ought to be accepted in preference to that of the unskilled onlookers.

IV. The evidence requisite to determine the duration of gestation prior to birth stands on a different basis. In this detail I have come to the conclusion that the suggested definition does need amendment. The amendment which appears to me to be most practical is the adoption of a standard of length of the body. There is, however, this one difficulty, viz., that all embryos do not grow to the same length within the same period of uterine gestation. Consequently, any standard of length must be more or less arbitrary. The length which might be adopted is one of 32 cm. (13 inches), measured from the crown of the head to the heel. With such a standard anyone possessing common sense and a yard measure would be able to decide whether the dead foetus was to be held to be a still-born child or not.

At my request the Council of the Obstetrical Section of the Royal Society of Medicine referred the Report of the Committee to a Committee of the Council to report to them on the proposed definition of the term "still-birth." I have received from the Hon. Secretary of the Section the following amended definition which the Council of the Section has approved:—

"A still-born child means a child which measures more than
 "thirteen (13) inches in length from the top of the head to the
 "heel, and which, when completely extruded from the body
 "of the mother (head, body and limbs, but not necessarily
 "the afterbirth), exhibits no sign of life by crying, or
 "breathing, or by pulsation in the cord at its attachment to
 "the body of the child or by beating of the heart."

N.B.—The final test of life is the pulsation of the heart, but this can only be ascertained by an expert.

The definition here suggested is in close agreement with that drafted by me, the only difference being the inclusion of the signs, viz., crying and breathing, which I have described as secondary. The note to the definition relegates such signs of life to their proper position and practically reduces the proposed definition to the terms originally suggested, except for the substitution of the length of the child's body as the test of the duration of the pregnancy, a substitution with which I am in agreement.

The form of the definition drawn up by the Obstetrical Section of the Royal Society of Medicine presents certain advantages. I am, therefore, submitting an amended definition of a "still-born child," which will, I hope, commend itself for general adoption:—

A "still-born child" means a child whose body at birth measures not less than 13 inches (32 centimetres) in length from the crown of the head to the sole of the heel, and who, when completely born (the head, body and limbs of the child, but not necessarily the afterbirth, being extruded from the body of the mother), exhibits no sign of life—that is to say, whose heart has ceased to function, as demonstrated by the absence of pulsation in the cord at its attachment to the body of the child and absence of any heart-sounds or impulses.

NOTE.—Crying and/or breathing—being secondary signs of life, manifested only when the heart is acting—can be relied upon as signs of life, but the absence of either or both is not to be held to be proof of the absence of life in the child.

B. Registration of Still-births.

This is required in all the countries and states from which replies were received by the Committee, except:—

England and Wales, Ireland, Scotland, Gibraltar, Cyprus, Hong Kong, Gambia, Orange Free State, Sierra Leone, Jamaica, New Brunswick, New South Wales, New Zealand, Queensland, South Australia, Tasmania, Victoria, Denmark, Mississippi, New Mexico, North Carolina and Virginia.

With regard to Mississippi and North Carolina there is no registration of births at all, and in Virginia in towns only is registration in force. In Denmark, although registration of still-births is not prescribed by law, it is in practice regarded as compulsory. In England and Wales "notification" of still-births is in force in those sanitary areas where the Notification of Births Act has been adopted. At the date of the Report the Act had been adopted in 316 "local government areas" having a total population (Census 1911) of just on 18,000,000 persons.

The large majority of the countries where registration is not required are under the British Crown, and it may be concluded that the Registration Laws in force in such countries have been based on the English model.

The Committee came to the conclusion that the registration of still-births ought to be established in this and all countries. As far as this country is concerned, the Committee, in their decision, endorsed the recommendation of the Select Committee (1893) of the House of Commons on Death Certification. Of the fifteen witnesses—medical men, lawyers and coroners—who gave evidence on the question of still-births before that Committee, only one was not strongly in favour of making the registration of still-births compulsory. The exception was Dr. Ogle, then Medical Superintendent of Statistics at the General Register Office. He regarded the proposal as "impracticable." The suggestion would, doubtless, be more or less impracticable in the absence of a satisfactory definition of still-birth, although the experience of those countries where registration is in force, even without a definition, does not endorse the allegation of impracticability. The operation of the Notification of Births Act has also refuted that allegation, and I believe that public opinion in this country is now ripe for the passing of a law setting up such registration. It may, therefore, be not disadvantageous to inquire what such registration may be expected to teach us.

Up to the end of the last century the rate of infantile mortality had fallen very little, if at all, below that which prevailed at the commencement of civil registration (1838). Within the last seven or eight years there has been a notable fall in the rate; and although some of the decrease has doubtless been due to the cooler weather of the summers of those years, yet there is no room for doubt that the greater part of the decrease has been due to other causes, viz., more intelligent methods of rearing children. I do not wish to pose as a pessimist, but I cannot help thinking that we are approaching the lowest limit of the rate of mortality which can be expected to be attained by the present methods of prevention. Such methods are for the most part concerned with postnatal causes of mortality. Antenatal causes, except so far as ordinary sanitary activities may affect them, have not been taken up at all. Indeed, I would go further and affirm that we know very little about them, as the data on which such information can be drawn have been wanting. The letter from Mrs. Bulley, published in *The Times* on August 20 last, and the leading article "The Registration of Births," in the same issue, are both very much to the point. "Ignorance is the devil's best asset" quotes Mrs. Bulley, and that ignorance can only be removed by a strict enforcement of the

registration of still-births, but something more than a mere compilation of the numbers of still-births must be provided. This consideration leads to the problem as to the manner in which still-births should be treated by the law.

The analysis of the replies received to the question "Are still-births registered as (*a*) births, (*b*) deaths, (*c*) both, or (*d*) in a "separate register?" as given in Table C of the Committee Report,⁷ reveals a marvellous variety of practice, almost every conceivable combination of the possible answers being reported. The Committee did not discuss the question now before us at all, but limited themselves to recommending the registration of still-births and their separate tabulation. For the study of antenatal causes which produce still-births, it appears to me to be necessary that still-births should be regarded as deaths, and that a medical certificate of the cause, or causes, which produced the death of the child should be insisted on in every case. A tabulation of the causes of death, according to the probable intra-uterine ages of the children, will very soon elucidate the problems which at present appear to be insoluble. Once the causes are known, it should not be beyond the ingenuity of social reformers and sanitary administrators to suggest the required remedies. That much to be desired end having been attained, it should be possible to reduce infantile mortality to limits considerably below that which I believe can be reached by our present restricted methods. In that way the present shortage of new lives resulting from the lower birth-rate will be amply compensated.

There is also one other influence for good which may be expected to accrue from a study of the antenatal causes which result in still-births. I refer to the possibilities of placing some check upon the production of live-born children of enfeebled bodily and mental powers. This point was ably dealt with by the writer of *The Times* article already referred to.

To those who have given any time to the study of infantile mortality and of mental deficiency, there can be no room for doubt about the necessity of making the registration of still-births compulsory, together with the certification of the causes of the same. It may not at first sight be pertinent, but I consider that to achieve successful registration of still-births the period of registration must be much shorter than that at present allowed for live-births, viz., six weeks. Indeed, I am unable to find any arguments convincing to myself, in favour of such a long interval for live-births, and I earnestly hope that the Government will be able, at no distant date, to find time to take up the question of the amendment of our Registration Laws, and bring them into

⁷ See p. 62 of this issue.

closer agreement with what our present experience proves to be requisite.

C. *Calculation of Infantile Mortality.*

By "infantile mortality" is meant, in most countries at least, the ratios of deaths under one year of age to births, but in a few countries the ratio of such deaths to estimated numbers living at the same age is still in use. Such ratio can only be described as most unsatisfactory and even illusory.

The estimation of the numbers living at ages under one year is not only laborious, but the results obtained are far from being reliable. The commonest method of making such estimate is that depending on the number of the living at ages under one year as determined by the census expressed as a proportion of the population at all ages. Such method involves two sources of error—namely, that associated with all estimates of population during an intercensal period, and that arising from the assumption that the infants under one year of age form a constant proportion of the total population. In whatever manner the estimate be obtained, it appears to be undesirable to select such value (to which a large measure of uncertainty always attaches) for the determination of infantile mortality in preference to the number of births (a value to which a minimum of uncertainty attaches in countries where the registration of births is complete). It is very desirable that the latter value should be universally employed.

So far births have been referred to without qualification. In this country no qualification is, with the present law, necessary as we have no knowledge of the numbers of still-births. How then should these last be treated in calculations of infantile mortality? To that question no one answer can be given, as the method of dealing with still-births will depend on the use to be made of the statistics. Three cases must be provided for—

- (a) Inquiries relating to complete fertility in women ;
- (b) Studies of mortality among children who attain to "life"—
which is not the same as reaching live-birth ; and
- (c) Studies of the mortality of children born alive.

In dealing with the first subject the total number of conceptions is really needed, but it is hopeless to expect ever to obtain such a figure, and the numbers of still-births must be accepted as the best substitute.

The second subject will evidently involve the use of the total numbers of live- and still-births, while the third that of the live-births only. An examination of the rates obtained by the method (b) in conjunction with the causes of death, both ante and

postnatal, will throw light upon the factors producing death both before and after birth, and a study of the rates furnished by (c) will be concerned in part with antenatal but mainly with postnatal factors.

To provide for the various needs of inquiries it seems to be requisite that still-births should be separately tabulated in official returns, such tabulation to include an analysis of the still-births according to the reputed causes. If the present diversity of duration of gestation (from four months in Japan to seven months in most other countries) is to continue, the tabulation of still-births must include an analysis according to the duration of gestation before birth.

There remain the cases of countries such as France, Belgium and Holland, where children who have lived as long as three days may be counted as still-born, and of Spain where a child dying during the first day of life falls into the same category. It is very desirable that such countries should be induced, if possible, to adopt an international definition of still-births and to bring their registration laws into conformity therewith. If that cannot be effected, the official statisticians should publish tables showing the numbers of live-born children included among the legal still-births. This is done officially by the Bureau de Statistique of the City of Paris. In Italy, on the other hand, where five days are allowed for the registration of births, children born alive but dying before registration are held at law to have been "still-born," but are counted as "live-born" in the official statistics.

I venture to think that we shall all agree that more uniformity is required in the statistics relating to still-births and infantile mortality, and I hope that what I have submitted has convinced you of the urgent necessity of (a) a real definition of the term "still-birth" and (b) the statutory registration of such births. The question of an international agreement on those points is one which the International Institute of Statistics should be asked to take into consideration. I hope to submit the subject to the next Congress, which is fixed to be held at Vienna during the coming year.

DISCUSSION *on* DR. DUDFIELD'S PAPER.

SIR ATHELSTANE BAINES, in moving a vote of thanks to Dr. Dudfield, said the Paper contained, as it seemed to him, a very clear and adequate presentment of a question, which, to medical men, had long been one of the utmost difficulty. He would have liked, had it been in order, to have extended the vote to the whole Committee over which the writer of the Paper had presided; but he was entitled, at all events, to express on behalf of the Society their gratitude to Dr. Dudfield and his colleagues for the care with which they had investigated this subject, and the remarkable amount of information they had collected in the Report published last August. Though he was not on the Committee, he might say that he had heard that Dr. Dudfield had taken upon himself the lion's share of the trouble involved in obtaining the data from the 136 units mentioned in the Paper, and to him was due the credit of arranging them in a way that rendered them useful to the lay inquirer. He was glad to know that Dr. Dudfield intended to bring the question of the definition and registration of still-births before the International Institute of Statistics at the next Congress. Some, perhaps, might wonder that it had not already received more attention from that body, but he could say that the matter had frequently been informally discussed, further progress being stopped by the difference in practice in the various countries represented in regard to this registration, still more in respect to the definition of still-birth. Our country was undoubtedly at a disadvantage on this point, but he did not think that Dr. Dudfield was handicapped more heavily than France, Holland, and the United States, as to which last the footnote to the Paper conveyed information regarding the basis of calculation of infantile mortality which astounded him. It was not overstating the case to say that, in spite of the solemn quotation of international figures regarding the above rate, in official and other publications, statistically sound comparison between countries was not now possible. The elimination of the still-births was as necessary in the calculation of infantile mortality, denoted (C) in the paper, as their inclusion was for the estimate of fecundity, in (A). One remark of the author, in connection with (B), seemed to him very important in its relation to the rate of natural increase. Assuming that the birth rate continued its downward tendency, the difference between it and the death rate must necessarily diminish, unless the decline in the latter were maintained proportionately. Dr. Dudfield thought that mortality amongst infants, the leading feature in the returns, had nearly reached its minimum, so far as post-natal disease was concerned. Unless, therefore, the ante-natal conditions were ascertained and dealt with, the two rates would, of course, approach each other, a tendency already exciting attention, he thought, in Australasia. As to the recent and somewhat sudden decline in the infantile mortality of this country, he would ask Dr. Dudfield whether it was not principally attributable to the bad

fruit season of recent years, rather than to improvement in parental care. He had seen the former cause mentioned in one of the Annual Reports, but could not say whether the remark was confined to that year only. The most important part of the Paper was concerned with physiological considerations with which he was not going to burn his fingers beyond making one suggestion based upon his experience in connection with a nursing association. This was, that the fully-trained midwife was so superior to her predecessors that she might, perhaps, be trusted to apply the tests of life mentioned in the Paper. He would now only renew the expression of his thanks and leave the subject to the experts.

Dr. GREENWOOD, in seconding the vote of thanks, said he would like to associate himself with everything Sir Athelstane Baines had said, and particularly call attention to the extreme clearness with which a most difficult and complicated subject had been put before an audience some of the members of which would perhaps not be familiar with the physiological points touched on. As Dr. Dudfield had remarked there were a large number of topics in the Paper for discussion, and he would therefore like to save time by more or less confining himself to the question of the definition of "still-birth." The fact that all the official bodies which had dealt with that point had fought shy of committing themselves to an exact definition was rather a suggestion that it was really a matter of extreme difficulty, and the first point he would like to raise for discussion was as to whether there were such a thing as any one basal sign of life. He thought nearly all of them would be entirely unprepared to define life, although they had all a somewhat precise idea in their own minds as to what they meant by living or dead, and he took it they meant (although it was not a definition), in the case of any animal like man, that so long as the partnership or co-operation between his different cellular systems was not permanently dissolved, although it might be suspended, life endured. Was it possible that any single sign would tell them whether the partnership were simply suspended or finally dissolved? For instance, was it possible the heart might go on beating in the case of an animal which, regarded from every other point of view, was definitely dead? It was certainly a fact that one might get a condition in which the heart was beating automatically yet one could hardly say that the animal was alive. Therefore if they were going to be very precise in their definition that introduced a difficulty. Conversely could they definitely say that when the heart was not beating the animal was dead? He (the speaker) doubted whether a categorically affirmative answer could be given. Those were points which made one hesitate in characterising the beat of the heart as *the* basal sign of life. He imagined what Dr. Dudfield meant was that it was a more trustworthy sign than respiration; so that really the question arose, taking the matter as a practical one, whether if one were to insist on the question of the beat of the heart being considered the ultimate criterion, one would save an appreciable number of children who by the breathing and crying test would be regarded as born

dead. Supposing one insisted on this further test, would one be able to save such children? To begin with, he thought the ascertainment as to whether the heart were beating might perhaps be a more difficult matter than was suggested, because he took it the question would only probably arise in cases in which the action of the heart was rather feeble. Supposing the action of the heart was strong and vigorous, the chances were they would speedily get evidence of respiration as well. In the cases in which there was no doctor in attendance, which would after all be the majority of cases, it was a little doubtful whether the introduction of the definition would be likely to effect an appreciable saving in life. It did seem to him there was an objection to stereotype in any way a test which was likely not to be competently carried out by untrained persons, and might therefore tend to the neglect of simpler, even if less reliable, observations. He thought therefore that a much wider statement, not of the nature of a definition, but such statements as the one quoted by the Committee from the regulations of the Cape of Good Hope, was on the whole safer and calculated to avoid the risk of introducing a provision which might not be effective in the case of untrained persons.

Dr. AMAND ROUTH said that when the Council of the Obstetric Section of the Royal Society of Medicine was asked by the Royal Statistical Society to try and arrive at a definition of "still-birth," they realised its difficulties a little, but they were quite surprised, when they studied Dr. Dudfield's report to the Society on the subject, to find what an extremely complex question it was, and how diverse were the opinions held, not only by different countries, but by different authorities in those countries. First of all, one must remember that, as regards the general meaning of "still-birth," it should include both abortions and children born after a viable age, which they looked on as twenty-eight weeks. From the point of view of doing good and trying to prevent those deaths in both of those periods of intra-uterine life, it would be a very good thing if they could get notification, not only after the viable age, but also even before viability; but he supposed that was impossible. Dr. Dudfield, in his Paper, had said that they had very little knowledge of the number of still-births—which was quite true—but they had something to go upon. In 1887, Dr. Priestley, a distinguished obstetrician, calculated that in London alone there were 9,000 abortions due to preventible causes, and if the same proportion held all over England and Wales that would indicate that there were about 70,000 abortions due to preventible causes. That is the calculation he then made. Still-births had now been notifiable in London since 1909, and in 1910 over 2,300 notifications were made for London, which represented 2·2 of the total births. If that percentage were applied all over England and Wales, it would come to over 19,000 still-births. Then another remarkable fact was mentioned in the Registrar-General's Report, that 24,600 children died during the first three months of their life from causes connected with birth. That all went to show what an extremely important

thing it was that their attention should be focussed on infantile mortality, and more especially on mortality occurring at or about the time of birth. Most of those children who died *in utero* before labour came on died during the last few days of gestation, and if they could arrive at something like a determination of the causes they would save a good many lives by inducing labour before the time of the probable foetal death. That was done to a certain extent at present. A good many of these cases died actually during the birth itself. They could not tell how many, but there was a considerable number—some due to maternal causes such as pelvic contraction, hæmorrhage, and so on, and others due to foetal causes such as the mal-position of the child—and obstetricians were doing a very great deal to lessen the mortality due to both causes. He mentioned, amongst other evidences of progress, the operation of Cæsarean Section, which was now much more frequently performed than it was twenty or thirty years ago. The maternal mortality used to be 80 or 90 per cent., but was now only about 2 per cent. in “clean” cases, and if the child were alive at the beginning of the operation the foetal mortality was practically nil, and those children would inevitably have died if that operation were not done. He thought the diminution of foetal mortality was very largely due to the inculcation of better methods of nursing, and of nurture, the result of lectures to young mothers and visits to mothers by sensible women, and also, as one of the speakers had said, to the education of trained midwives. The Obstetrical Society, as they knew, advocated the training of midwives more perhaps than any other body, and they still earnestly advised that midwives should be more highly trained. It was a step in the right direction, because not only did it save lives during the birth itself but it brought healthy children into the world instead of children injured by the effects of delayed labour if they were born without due skill. As regards the definition of still-birth, he could not quite follow the altered definition as suggested by Dr. Dudfield, viz., “a still-born child means a child at birth which measures more than 13 inches.” Did Dr. Dudfield mean that the 13 inches might vary a little? At best it was only an arbitrary measurement and the child would be much the same a few hours afterwards. What was the object of putting in “at birth”? In the third line it was stated: “and which, when completely extruded from the body of the mother (head, body and limbs, but not necessarily the after-birth), exhibits no sign of life.” That “when” meant at the moment of birth. They did not think it necessary to put it in, but after all it was an important thing, and it might be advisable to emphasize the meaning of the word “when.” If someone came in five minutes afterwards and found no signs of life it was no proof that the child was still-born. It might have been alive for two or three minutes. The Obstetrical Section said “The final test of life is the pulsation of the heart, but this can only be ascertained by an expert.” It was a very difficult thing to hear the foetal heart when it was fluttering very feebly after birth, and it could practically only be done by putting the ear to the chest or using a stethoscope, and in difficult cases would certainly

require some knowledge which even a trained midwife could not be expected to have. Clearly in his opinion still-births should be compulsorily registered, and he thought that in addition to being separately scheduled, they should at the same time be included both in the live births and the deaths. There should be the live births and the deaths on the one hand, and a separate table made so that they could be abstracted from that list and dealt with in other ways. Dr. Walter Griffith would deal with the details of the suggested definition, as he was especially associated with the Executive of the Obstetric Section of the Royal Society of Medicine in their efforts to make this definition. He would like to congratulate the Royal Statistical Society on their most excellent report, the best compendium of the sort he had ever seen, and also to congratulate Dr. Dudfield both for that Report and for his Paper read that evening.

Dr. WALTER GRIFFITH said he would place before the meeting some of the reasons why the Council of the Obstetrical Section of the Royal Society of Medicine had decided to recommend the form of definition which was before them for discussion. The Council considered that what was needed was a definition as accurate as possible, but sufficiently simple, so that it could be applied by any person present at a birth, however uninstructed, and by registrars and lawyers as well as by medical men. Such definitions must be a sort of compromise between scientific accuracy and utility, and such compromises were always open to criticism. Why was the length of the child taken as the indication of its sufficient development? For the simple reason that anyone with a tape-measure could measure the baby with accuracy, and the measurement was easily verified, while there was no reliable alternative. The alternative in common use was to speak of so many months or weeks of development, but it was not possible in any given case to ascertain the duration of gestation with certainty. All they knew with certainty was the date when pregnancy terminated. The date of commencement was so uncertain that errors of weeks and sometimes months were quite common owing to physiological conditions which varied in different individuals; consequently the supposed duration of pregnancy was quite unreliable, and they therefore suggested an arbitrary measurement of 13 inches which corresponded to the 32 centimetres officially in use in Prussia. From the purely medical point of view there would be advantage if every fetus, recognizable as a human embryo, were included in the registration, the so-called "moles," which had no possible chance of development into human beings, being alone excluded. Then as to the words "when completely extruded from the body of the mother." Why should it be completely extruded? The answer was to avoid complication in the definition, and because it was in accordance with usual legal practice. In the very large majority of births, namely, 97 per cent., the babies came headfirst, and when a baby came headfirst it could be born alive and survive, without being completely extruded. In the remaining 3 per cent. the head came last, and if retained in the

body of the mother the baby was suffocated unless someone was at hand who was able to deliver it. Now the interval which might elapse between the birth of the head and the rest of the body in headfirst cases made the destruction of a living child easy, and the practical impossibility of deciding whether a child had died before complete extrusion or after (the former not being "murder" in the view of the law) enabled many a child-murderer to be acquitted. "Exhibits no signs of life." Their definition suggested easily recognised signs of life. Dr. Dudfield had very properly suggested, and his view was practically unassailable, that the fundamental sign of life was the action of the heart. They were not there, however, to discuss physiology, but the practical application of physiological facts by methods as simple as possible, so as to be usable by persons of no special training. What was the evidence in a supposed criminal or civil case that the lawyer attempted to obtain? He had to prove that the child was born alive, the law taking it for granted that the child was born dead until this was proved, and the first evidence of life which anyone in the near neighbourhood could ascertain was the cry of the child. If the child was not heard to cry, respiratory movements were easily recognised. Movements of the limbs or other parts of the child were deceptive and unreliable, because, under the circumstances of birth, any movement of the mother might be communicated to the infant, and movements of the arms, legs, or head might easily be mistaken for spontaneous movements of the child. Pulsations of the cord were the most easily recognisable evidence of the action of the heart. Those pulsations were felt at the end of the cord which was attached to the child long after they had ceased to be felt at the other end. If no pulsations were felt, only a trained doctor who was a very careful observer (and not always he) could determine in difficult cases whether the heart was beating or not. It was not a rare thing for the baby to be put aside by the doctor and nurse as dead while they were attending to the other needs of the mother, and yet before long the baby would begin to cry and prove to be a healthy child. With regard to the definition as a whole, he preferred that recommended by the Obstetrical Section to the amended one of Dr. Dudfield. Dr. Dudfield had taken the most difficult point of recognition of life first, which (although clearly correct for scientific purposes) seemed to him to be less desirable for the purposes for which the definition was to be used. Dr. Greenwood had asked whether children did survive when born with feeble pulsations in the cord—that is, with a feebly-acting heart, but without any respiratory action. He would say that the vast majority did, if they were kept warm. If the child, however, had such injury to its brain, or to some other organs in its body as it might get in a difficult birth, then the action of the heart would gradually cease, and respiratory movements might not be established. He wished to join in admiration of the amount of valuable information which the Committee of the Royal Statistical Society had gathered in their Report, particularly of the share in it of their Chairman, Dr. Dudfield.

Dr. BUTLER said he would like to address himself to the question which seemed to be the burning one, namely, as to what should be accepted as evidence of live-birth. Dr. Greenwood pointed out that there was no fundamental or basic sign of death. That fact in itself, it seemed to him, was one that was cardinal to that question. Dr. Dudfield gained nothing by insisting upon evidence of circulation having continued after birth as being the crucial test of life, because, as Dr. Greenwood had pointed out, after circulation had ceased life was still demonstrable in the tissues. Contractivity of the muscles could be elicited long after circulation, respiration, and the other more obvious signs of life had disappeared; so that there was no physiological necessity for relying upon evidence of circulation as the sign of life or its absence as the sign of death. On the other hand it was of the utmost importance, particularly from a statistical point of view, that a sign conveniently observable should be taken as being crucial in the matter—and it was convenient to take what had been taken in the past, namely, obvious signs such as respiration. There were many reasons why that was convenient. To begin with it was a new function that was established with the birth of the child. Circulation, heart beating, went on prior to birth, and it merely continued afterwards. Breathing was post-natal quite definitely, and the failure to establish that function was in itself one of the commonest causes of death. The majority of children born took on that function with some difficulty. They knew that for considerable periods they might not give evidence of breathing. They did not breathe in fact. Their circulation might go on during that time, but until breathing had been established it would be quite proper to assume that the child was not living an independent existence. It was because an arbitrary standard must be adopted in those matters and because the establishment of actual breathing was readily ascertainable, not only by direct observation but also by post-mortem examination, that it was desirable for statistical purposes to continue the existing practice of assuming independent life only after the establishment of the particular function of respiration.

Professor WESLEY C. MITCHELL (of the University of California) said an American was particularly reluctant to speak upon the subject of registration statistics; because the practice of his own people in that matter was backward. This backwardness had been adverted to in a footnote to the Paper, and it had been mentioned again by Sir Athelstane Baines. As an American he regretted to say that these gentlemen had spoken less than half the truth about the matter. That this elaborate discussion of the registration of still-births was taken so seriously showed that England was ready to make exceeding refinements in the practice of a branch of statistics which many of the American States were neglecting altogether or practising very roughly. The best thing he could hope for was that within the next few years his whole country might arrive approximately at such a stage of success in registering births and deaths as had already been attained in Great

Britain. He would not venture to guess how long it would be before they reached the further point at which they would be ready to discuss methods of registering still-births as a matter of grave importance in their statistical practice.

Mr. YULE said he did not think he had anything substantial to add to the discussion, but he wished to join with the previous speakers in expressing his admiration of the work that Dr. Dudfield had done. There was only one point on the question of definition on which he would like to ask a question. Supposing it were legally enacted that still-births should be registered, and a definition of "still-birth" were included in the Act, would it follow that that definition would be legally recognised as a definition of "still-birth" for other purposes? It seemed to him there were really two distinct things to be dealt with: the practical definition for the purpose of registration of still-births, and the quite different question, with which they in that Society were not concerned, the question of whether a birth was a still-birth when a woman was on trial for murder. It appeared to him that those two definitions might really be very different, because, in the case of registration, they were concerned with the practical definition and tests to be applied during life, and in legal cases they were concerned with some sort of test which could be applied after death, and possibly some time after death.

Dr. DUDFIELD, before replying to the discussion, read the following letter from Mons. Lucien March:—

"In your letter of October 21, you have asked me to let you have any observations suggested to me by a perusal of the 'Report on Infantile Mortality' drawn up by the Special Committee of the Royal Statistical Society.

"While cordially agreeing with the recommendations of the Committee set out on page 19 of the Report, I should like to direct attention to the following three points:—

"(1.) The necessity of shortening the time allowed for the registration of births, and equally of still-births.

"I am in some doubt whether the English statistics of mortality in the first year of life are not vitiated by many omissions of deaths during the first six weeks of life—a time when the mortality is at its highest.

"(2.) The need of fixing the duration of gestation after which the product of gestation shall be counted as a still-birth.

"It appears to me to be difficult to determine the exact duration of gestation in any case, but then it is not easy to decide in every case whether a foetus has or has not lived after birth. I believe it is better to have some definite term fixed rather than to leave the question open.

"(3.) The difficulty of saying how many weeks gestation has lasted.

"I think we should content ourselves by measuring the gestation by months, not weeks."

Continuing, Dr. Dudfield thanked those present for the reception accorded to his communication and for the full and interesting discussion. With regard to Sir Athelstane Baines' observations, he (Dr. Dudfield) felt convinced that there had been within recent years a material reduction in infantile mortality from post-natal causes, quite independently of the reduction which could be attributed either directly or indirectly to climatic conditions more favourable to infantile life. That view had been endorsed by the Medical Officer of the Local Government Board in his Report (1910) on Infant and Child Mortality, and by the Medical Superintendent of Statistics in various Reports of the Registrar-General. The interesting doubts as to the possibility of giving one basic test of life or death raised by Dr. Greenwood, did not appear to him (Dr. Dudfield) to be quite pertinent to the matter under discussion. They were seeking a test of life which could be used in the ordinary routine of medical practice, and common experience pointed to the fact that in ordinary routine work resuscitation of an apparently dead infant was not possible after the heart had ceased to beat. It was for that reason that persistence of the heart's action had been selected as the test of life in a newborn child. It was within his own knowledge and experience that infants in whom the respiratory function was in abeyance—or had not been evoked after birth—could be "saved" so long as the heart was active. Dr. Routh's estimates of still-births were, he thought, far too low. Speaking from memory he thought the average proportion of still-births in European countries was nearer 5 than 2 per cent. of the total live-births. Whatever the proportion might ultimately be found to be, he had no hesitation in saying that by reducing their frequency and preventing their occurrence, a very large number of lives could be "saved" to make up the existing deficiency in "live-births." Dr. Griffith—and the Council of the Obstetrical Section—wished to retain breathing and crying as the routine tests of life. Such signs were undoubtedly indisputable evidences of life—but what about infants who failed to exhibit those signs at birth? He had given proof (or what appeared to him to be proof) that many of such children were alive, so that the absence of those signs could not be accepted as evidence of still-birth. He hoped that it would be recognised that the time had come to accept the amended definition which he had embodied in the Paper, to make the heart's action the test of life and to recognise that breathing and crying—signs which could be manifested only when the heart was acting—were only confirmatory (secondary) tests of life. He agreed with Dr. Butler's suggestion that breathing was a function which was taken on after birth only, and that failure to establish function was one of the commonest causes of death. He could not accept the suggestion that they ought therefore to make the presence or absence of respiration the test of life or death at birth. Indeed he thought Dr. Butler had really adduced strong proof in favour of making the heart's action *the* test when he said that "failure to establish that function (*i.e.*, respiration) was in itself one of the commonest causes of death." Dr. Butler appeared to admit that

there was life in such a child, although respiration had not been established. The confirmation by Professor Mitchell, as to the American practice of neglecting birth during the first week of life in calculations of infantile mortality, was the more striking (however regrettable) as it was unexpected. He (Dr. Dudfield) had hesitated to refer to the practice, and had therefore only mentioned it in the footnote. It was to be sincerely hoped that the American States would be able at an early date to find sufficient leisure to extend registration and to improve their statistical methods. Mr. Yule's question, as to the possibility or otherwise of any suggested new definition of still-birth being accepted at law—outside statute law dealing with registration—was a pertinent one, but one which must be left for the legal profession to answer. He could see no real objection to there being two definitions current at first, but he believed that the existence of the two would not be of long duration. The suspicion that a number of live-born children dying during the early weeks of life escaped death registration, to which M. Lucien March alluded in his letter, was of considerable antiquity. Whatever may have been the case in the early days of civil registration, he did not believe that there was now any foundation for that suspicion. In conclusion, Dr. Dudfield expressed the hope that they would not be content to stand still in this matter. Midwives—who had charge of some 75 per cent. of all confinements—were being steadily improved in training and capacity, so that they were now able to be entrusted with the application of tests of life of greater delicacy—and of greater certainty—than were their predecessors. No one would, he thought, suggest that the proposed test was beyond the skill of a medical practitioner.

The following candidates were elected Fellows of the Society:—

S. Narayana Aiyar.
 Henry Bennion-Booth.
 A. M. Brigstocke, I.C.S.
 V. A. Burrows.
 Yi Chen.
 M. Frazer.
 F. Hall.
 Professor Lincoln Hutchinson.

The Right Hon. Lord Lucas.
 L. B. Nevill.
 F. C. T. O'Hara.
 Truman G. Palmer.
 John Phillips.
 Percy Rockliff.
 A. Wotzel.

REPORT OF SPECIAL COMMITTEE ON INFANTILE MORTALITY.

INTRODUCTION.

IN March of last year the Executive Committee of the Council was invited to consider the desirableness of making some inquiry into the methods adopted by the statistical offices of the civilised world in the calculation of rates of infantile mortality, more especially with reference to the inclusion (or exclusion) of still-births. The Executive Committee reported in favour of the proposal to the Council, and the latter appointed this Special Committee for the purpose, the reference to the Committee being in the following terms:—

“To enquire into the systems adopted in different countries for the registration of births (including still-births) and deaths with reference to infantile mortality and to report to the Council.”

The Committee now submit their report, embodying the results of the inquiry, the scope of which has been extended considerably beyond the original suggestion. This report practically covers the whole system of registration and the calculation of vital statistics.

Letters covering an Inquiry Form (copy of which is included in the Appendix to this report) were sent to 136 registration officers, replies being received from 103. Three of the replies were from officials exercising a general control over national statistics, but not concerned with registration. Those replies came from the Dominion Census Office of Canada, the Imperial Statistical Bureau of the German Empire, and from the Census Office of the United States of America. The replies from those officials have not been included in the summary tables A—E, but those from the German and American Offices will be found in the Appendix (p. 81 *et seq.*).

The system adopted in summarising the replies (Tables A—E) requires some explanation. A list of the countries included in the tables is given in the Appendix (p. 79), distinguishing figures and letters being added to show the position of each country in those tables. The order of the countries in the tables is mainly geographical, save that the constituent states and countries of the British Empire have been kept together. Other countries have been arranged according to the continents—Europe, Asia, Africa, and America—and the countries in each continent arranged alphabetically.

In summarising the replies the subjects dealt with in the Inquiry Form have been grouped so that the replies contained in

Table A deal with the practice of registration in general; those in Table B with the efficiency of registration; those in Table C with the registration of still-births; those in Table D with definitions of still-birth; and those in Table E with methods of calculation of rates of natality (or fertility) and mortality. Distinguishing letters have been placed in front of each question in the Inquiry Form to show in which of the tables the replies have been included.

The report has been drawn up in four sections:—

- I. A brief history of registration;
- II. The practice of registration in general;
- III. Still births; and
- IV. Statistical methods.

Use has been made of information which has been found in previous publications, a list of which is given in the Appendix (p. 87). Copies of the registration laws at present in force have been sent with some of the inquiry forms. Such laws have been carefully examined and a good deal of supplementary information extracted from them. A list of the laws received, and one of reports, &c., which have been sent, will be found in the Appendix (p. 80). The documents have been placed in the Society's Library.

I. History of Registration.

The last question in the inquiry form was drafted with a view to learning the dates at which registration was established, but the question does not appear to have been always understood. The dates given in the replies have been entered in Table A (second column) with supplementary notes where required.

In Table 1 the earliest years for which statistics are available in the principal countries of Europe and other parts of the world are given. Several of the countries from which replies have been received by the Committee do not appear in that table, but, on the other hand, it includes a few countries from which no reply has been received. In nearly every country mentioned in the table the series of statistics is unbroken from the year specified in each case.

Registration of births and deaths was established in England as early as 1538, in the form of registration of baptisms and funerals, the records of which were kept by the lay clergy. Weekly "Bills of Mortality" were published in London about 1517, but their publication was irregular in the early years. The oldest copy known to be extant was published in 1532, six years before the registration of baptisms and funerals was made general throughout the country. Such returns were unsatisfactory in that they were compiled by lay persons, and as regards deaths, had no medical evidence as to the causes thereof. Moreover, registration being in the hands of the clergy of the Established Church, only such baptisms and funerals as were conducted by the clergy of that Church were recorded, all others being ignored. Nevertheless, the system outlined remained in force until the establishment of civil registration in 1838, but the latter

TABLE 1.—*Dates of Earliest Records based on the Present Registration Systems.*

	Births.	Still- births.	Deaths.		Births.	Still- births.	Deaths.
EUROPE—				ASIA—			
Austria	1819	1827	1819	Japan	1872	1886	1872
Belgium	1830	1841	1830	AMERICA—			
Bulgaria	1881	1881	1881	Argentine Republic	1899	1901	1899
Denmark	1801	1801	1801	Chile	1880	1903*	1880
England and Wales	1838	—	1838	Mexico	1895	1897	1895
Finland	1751	1861	1751	United States—			
France	1800	1840	1800	Connecticut	1848	1874	1848
German Empire—	1841	1841	1841	Maine	1892	1895	1892
Alsace-Lorraine	1841	1841	1841	Massachusetts	1849	1849	1849
Baden	1817	1840	1817	Michigan	1868	1868	1868
Bavaria	1825	1825	1825	Rhode Island	1870	1870	1874
Hamburg	1849	1849	1849	Vermont	1857	1857	1857
Hesse	1841	1841	1841	Mexico	1895	1897	1895
Prussia	1816	1816	1816	Uruguay	1878	1878	1878
Saxony	1827	1827	1827				
Wurtemberg	1841	1841	1841				
Greece..... {	1864-90	—	1864-90	AUSTRALASIA—			
Holland	1839	1839	1839	New South Wales	1860	—	1860
Hungary	1876	1876	1876	New Zealand	1861	—	1861
Ireland	1864	—	1864	Queensland.....	1860	—	1860
Italy	1863	1863	1863	South Australia	1861	—	1861
Norway	1801	1801	1801	Tasmania	1861	—	1861
Portugal	1886	1886	1886	Victoria	1854	—	1854
Roumania	1859	1863	1859	Western Australia ..	1861	1897	1861
Russia (parts of)	1867	1867	1867				
Scotland	1855	—	1855				
Servia	1862	1881	1881				
Spain	1858-70 {	1861-70 {	1858-70 {				
	1878 {	1881-88 {	1878 {				
		1900 {					
Sweden	1749	1749	1749				
Switzerland.....	1870	1870	1870				

“ — ” means “ not registered.”

* Only year of publication.

was not completely compulsory until after the passing of the Registration of Births and Deaths Act, 1874.

Registration was established by ecclesiastical law in Sweden in 1686, and the statistics of births and deaths date from 1749.

In Gibraltar registration of burials was established in 1679, of baptisms in 1704, and of marriages in 1705. The registers were kept by the clergy of the Roman Catholic Church.

According to the information contained in the replies received, registration is now in force in all countries save as here stated:—

Registration of births—not compulsory in

Finland, Iowa, Mississippi, North Carolina and Virginia (outside town limits);

Registration of deaths—not compulsory in

Finland, Mississippi and Virginia (outside town limits);

Registration of still-births—not compulsory in

England and Wales, Ireland, Scotland, Gibraltar, Cyprus, Hong-Kong, Gambia, Orange Free State, Sierra Leone, Jamaica, New Brunswick, New South Wales, New Zealand, Queensland, South Australia, Tasmania, Victoria, Denmark, Mississippi, New Mexico, North Carolina and Virginia.

Such account of the practice of registration cannot be considered as complete as no replies were received to the inquiries addressed to—

British Empire—

†British Columbia.

†British Honduras.

†Cyprus.

†Falkland Islands.

*Fiji.

†Quebec.

EUROPE.

German Empire—

†Baden.

†Brunswick.

†Mecklenburg-Schwerin.

†Oldenburg.

†Greece.

†Portugal.

†Russia.

†Servia.

ASIA.

†China.

†Brazil.

†Chile.

Guatemala.

Honduras.

†Mexico.

AMERICA.

United States.

§Alabama.

§Arkansas.

§Delaware.

§Florida.

§Idaho.

§Kentucky.

§Louisiana.

§Oklahoma.

†Pennsylvania.

§South Carolina.

§Tennessee.

†Vermont.

II. Practice of Registration.

“Registration” implies two acts—viz., that of “declaration” and that of “inscription.” It is, therefore, desirable to examine the practice of “registration” under those two heads, and to do so for births and deaths separately.

DECLARATION.—Except in so far as the increase in the number of persons who are made liable for declaration tends to reduce the possibility of any birth (or death) remaining unknown to the registration authority, it does not appear to be material to the present issue to consider on whom that responsibility is placed. No question on the point was included in the Inquiry Form, but some of the answers received gave information on this head, and in other instances the Registration Laws in force were sent with the Inquiry Forms. A brief summary of the practice in England and

* Registration is in force for Europeans only.

† Registration is known to be in force.

‡ No registration outside European settlements.

§ Registration not in force as late as 1906.

Wales, with some account of the differences in those countries for which information is available, has been thought to be of sufficient interest to justify its inclusion in this report.

Births.—By the registration of Births and Deaths Act, 1874 (37 and 38 Vic., c. 88, s. 1), the duty of declaration is cast upon the "father and mother" of the child, if legitimate, upon the mother only, if illegitimate, and, in their default, upon "the occupier of the house in which to his knowledge the child was born and upon every person present at the birth" and also upon "the person having charge of the child." In 1907 an Act entitled "the Notification of Births Act, 1907," was passed, which is not in force throughout the country, but only in those sanitary districts* which have "adopted" it in the prescribed manner, providing for an additional declaration of a birth† by the father of the child (including an illegitimate child) if residing in the house at the time of the child's birth, and by any person in attendance on the mother at the time of the birth or called in to render attendance within six hours of the birth. In some districts voluntary arrangements are made by the supervising authorities for midwives who are on the roll of midwives (kept under the "Midwives Act, 1902") to send them periodical returns (usually weekly) of all births attended by them.

In the majority of the countries from which the Registration Laws have been received, the list of persons and the order of their responsibility do not differ materially from those prescribed for this country. In Belgium the duty of declaration is imposed on all present at the birth of the child without any distinction. In Switzerland, the mother is the last person responsible, and her responsibility is not effective until after her recovery. In New Zealand the occupier of the house is primarily responsible for "notifying" the registrar, and he must do so within three days (the parents and other persons responsible for giving the required particulars are allowed 62 days). In the following countries and States the medical practitioner and (or) midwife are required to give the first information, the prescribed period varying in different countries:—Nova Scotia, Ontario, California, Colorado, Illinois, Nevada, New Jersey, New York, Ohio, Rhode Island, and Texas. In those countries the practice assimilates closely to that under the Notification of Births Act. In Illinois a fee of 25 cents is paid for each notification. The parents and other persons are required to supply subsequently the full information required by the registrar.

* The Act, limited to England and Wales, is at the present time in force in 316 "local government areas" having a total population of 17,923,973 persons (Census, 1911). The total number of such areas in the country is 1,822, viz., 29 metropolitan cities and boroughs, 75 county boroughs, 250 non-county boroughs, 812 urban sanitary districts and 656 rural, and the total population 36,075,269.

† The law relating to the "registration" of births is limited to the births of children born alive. The Notification of Births Act requires declaration of birth with respect to children born alive and to those born dead after twenty-eight weeks' uterine gestation. The returns supplied by midwives include still-births.

Deaths.—By Section 10 of the Registration of Births and Deaths Act, 1874, the responsibility of declaring a death of a person dying in a house,* is placed upon

- (a) the nearest relative of the deceased present at the death or in attendance upon him during his last illness ;
- (b) every relative living in the same registration area as the deceased ;
- (c) each person present at the death ;
- (d) the occupier of the house in which, to his knowledge, the death took place, and each inmate of the house ; and
- (e) the person causing the body to be buried.

In the case of a person not dying in a house, the responsibility for the declaration of death rests upon

- (a) every relative of the deceased having knowledge of the necessary particulars ;
- (b) every person present at the death ;
- (c) any person finding the dead body ; and
- (d) the person causing the body to be buried.

The variations in practice found in the laws which have been received can be grouped under three headings. (a) The occupier of the house is primarily responsible for informing the registrar in Alberta, Bermuda, Ontario, Saskatchewan, New Zealand and Western Australia. In the last case the occupier of the house is the only person mentioned in the law. In Bermuda and New Zealand the occupier of the house and the person burying ("principal agent") are named, and in New Zealand the occupier of the house, any person present at the death and the undertaker. (b) In Nova Scotia the medical practitioner is required to "notify" a death within 48 hours and at the same time to send in a certificate of the cause of death, the householder and the other occupants of the house to supply the necessary particulars before burial. In Illinois the medical practitioner is the only person named and he receives a fee of 25 cents for reporting. (c) The undertaker is responsible for all formalities in connection with the declaration of death in : California, Colorado, Nevada, New Jersey, New York, Ohio, Rhode Island and Texas.

INSCRIPTION.—The duty of recording the information supplied with the declaration of a birth (or death) rests with the registrar in charge of the Registration Sub-district in which the birth (or death) occurs. The delimitation of the unit districts is regulated by the Registrar-General, but the appointment of the necessary officers is made by the Poor Law authorities of the Parish or Union, such appointment being subject to the approval of the Registrar-General.†

* The procedure with respect to registration of deaths which fall within the jurisdiction of coroners is not dealt with here, as being of an exceptional character.

† It is an anomaly that the keeping of records of births and deaths, the foundation of all vital statistics, should be under the supervision of the Poor Law authorities, but the anomaly is explained by the fact that at the time when civil registration was initiated (viz., in 1838) those authorities were the only existing local bodies having charge of areas convenient for adoption as registration areas.

Special registration officers charged with the duty of inscription are the rule, the only known exceptions being those in Denmark, Finland, Norway, Russia, Servia and Sweden, where the clergy are responsible for this duty. In the United States of America the medical officers of health of townships and cities are usually the registration officers.

PERIOD PRESCRIBED (*le délai*) FOR DECLARATION.—*Births.*—The time prescribed by the Registration of Births and Deaths Act* is forty-two days, but late inscription can be effected, without charge, up to three months, and, on payment of a small fee up to twelve months. After the expiration of a year the consent of the Registrar-General is required and a higher fee has to be paid.

In other countries the periods vary within wide limits, ranging from twenty-four hours up to 90 days. In many countries (including certain in Europe) different periods are prescribed for towns and rural districts. In Denmark, for instance, two days is the normal period for towns, and eight for country districts. In Orange Free State 28 days are allowed in townships and 90 for the country generally. On the whole the time is longest in the countries forming the British Empire, but the following are notable exceptions—Newfoundland two days, Malta five, and Transvaal (towns) seven.

In Massachusetts births are to be reported not later than the 15th day of the month next ensuing. In Iowa, where there is no "registration," assessors visit each house annually, and make enquiries as to births which have taken place during the preceding twelve months.

Deaths.—The Registration of Births and Deaths Act prescribes that declaration and inscription shall take place before burial of the body, and in any case not later than five days after death. A "burial order" is then issued by the registrar. Burial can, however, take place without such order, but, in that event the person performing the funeral is required to furnish the registrar with information of the fact within seven days of the funeral. Moreover, if written notice of the death be sent to the registrar with a medical certificate of the cause of death, inscription can be effected at any time within fourteen days of the death.

It is self-evident that with a view to the prevention of crime the cause of death as well as the fact should be definitely established before the body is disposed of in any way. The principle is recognised in general by the laws of various countries relating to registration which in many cases simply prescribe declaration (with or without inscription) as necessary before burial. It is further evident that in hot climates early burial is a matter of necessity, and the same condition attaches to deaths from certain of the infectious diseases. Hence declaration ought to take place very shortly after death. On the other hand in sparsely inhabited countries (*e.g.*, newly settled lands) distance makes declaration of death before burial a matter of impossibility. In such countries special provision is made for declaration of death to take place after burial.

* The Notification of Births Act requires a birth to be reported within thirty-six hours of its occurrence.

The foregoing considerations will serve to explain the differences in the replies on this question tabulated in Table A (last column), which should be examined in conjunction with the last column of Table B. The exceptions to the first condition are so numerous that it appears to be more useful to examine the question from the side of safeguards against non-registration than from that of the time allowed for registration.

PENALTIES FOR DEFAULT.*—These in this country are the same for births and deaths and include:—for failure to make a declaration within the prescribed time, a penalty not exceeding forty shillings; for giving false information, if proceedings be by summary procedure, a penalty not exceeding ten pounds, if by indictment, the same fine or imprisonment for a term not exceeding two years, with or without hard labour, or to penal servitude for not more than seven years.

The penalties in force in other countries are given in Table B (first column). They range within wide limits, some appear to be too low to be, by themselves, sufficient to secure complete registration, others again are so high that a doubt is raised as to whether they are ever enforced. In any case, the power to inflict penalties of any kind is of little value unless there be added some system by which births (or deaths) which have escaped registration can be traced and the guilty parties brought to justice.

CHECKS AND SAFEGUARDS.—The efficiency (*i.e.*, the completeness) of registration depends in part (the greater part) on the willingness of the nation to comply with the State's requirements and in part on the legal provisions for bringing defaulters into line. The question of penalties imposed by law has been dealt with, and it now remains to enquire what provision is made for discovering omissions to register.

Births.—In this country registrars are directed by law to make it their business to get information of births occurring in their districts, but nothing is said as to how that is to be effected. Certificates of registration of birth are rarely demanded in the early years of a child's life for any purpose (*e.g.*, admission to school) in this country, and except by a careful scrutiny of the announcement in the papers, by the receipt of anonymous letters and by the declaration of death (in the case of young children only), it is difficult to see how the registrars are to hear of births except such as are declared in accordance with the law. In districts where the Notification of Births Act is in force the registrars have access to the Registers of Notification, and they can thus get information of births long before the "registration" period has elapsed.

The only country giving any information on this point is Switzerland, where it is stated that a certain (small) number of unregistered births are traced when the children apply for admission to the State Schools, the production of the birth certificate being an essential to secure admission. The same system is believed to be in force in the German Empire, but the point was not referred to in the replies received.

* Failure to notify a birth (in districts where the Notification of Births Act has been adopted) entails a liability to a fine not exceeding twenty shillings.

Deaths.—In this country declaration and inscription of a death need not necessarily precede burial of the corpse, and burial may lawfully take place without the issue of a “burial order.” When a funeral takes place and no such order is produced and delivered to the person “who buries or performs any funeral or religious service for the burial of the body,” such person must (under a penalty not exceeding 10*l.*) give written notice* to the registrar. Moreover, it has been held lawful to bury a body anywhere so long as no nuisance is created, and it is conceivable that the persons disposing of a body in an irregular fashion, *i.e.*, not in a cemetery, might be much interested in the death not coming to the knowledge of the authorities (registration or police). Although such cases as the last must be rare, except possibly in the case of still-births, there is unfortunately room for “leakage”—small, perhaps, but not altogether negligible. It remains to inquire whether any more effective checks have been set up in other countries.

In many instances it will be seen from Table B (column 3) that the replies as to burial without permit have been simple negatives, or negatives with reservations (*e.g.*, “not legally”), but in others the practice has been admitted to occur either as allowed by law or in contravention of the law. On the whole it would appear to be better to recognise burial without permit, in special circumstances, rather than to attempt to prohibit such practice altogether by providing penalties which are probably rarely capable of being enforced, and to provide sufficient safeguards to obviate non-registration. For that reason the regulation in force in Anhalt appears to be a good one; there, burial without a registrar’s permit is allowed, in special cases, on the authority of the chief of the local police, that officer reporting the issue of any such authorisation at once to the registrar. In Ceylon, again, special provision is made for burial without the registrar’s permit, subject to immediate report to him of any burial so taking place.

Other safeguards of interest are mentioned in the replies or in the laws which have been received, of which those in force in certain of the American States are worth special note. In California, Colorado, Nevada and Rhode Island undertakers must register themselves (annually usually) with the local registration authority, and they are held responsible for the due compliance with all the formalities relating to registration, including the record of the personal facts relating to the deceased, the medical certificate of cause of death, and the filing of particulars as to place, &c., of burial. When it is to the interest of anyone to comply with a law—apparently undertakers who did not carry out the law would be removed from the register—that law is more likely to be efficiently carried out. In Rhode Island, letters of administration cannot be obtained except on production of proof of registration of death; in Nevada, the sexton is required to record particulars of all burials in the cemetery under his charge, and the registers are to be open to inspection; while in Texas, monthly returns have to be sent to the registrar of the entries in the register. Similar returns are provided

* The Act says nothing of the particulars to be furnished in the notice.

for in Saskatchewan (monthly) and in Ontario (quarterly). In Western Australia, burial is prohibited except in the appointed public cemeteries. In New Zealand, any body buried, except after the issue of a burial permit, is liable to be exhumed, and the death to be made the subject of a police inquiry, the costs of which have to be borne by the person causing the body to be buried in the first instance. In South Australia the police act as assistant-registrars, and it is part of their duty to keep themselves informed of every death (and birth) which occurs in their district. A fee of one shilling is paid for each certificate sent in by them to the registrar. In Indiana, the duty of declaring a death is imposed on the medical practitioner last attending the deceased person; if default is made in such declaration the practitioner is liable to the prescribed fine, and in addition his bill for professional services is null and void.

EFFICIENCY OF REGISTRATION.—The answers dealing with this subject (Table B, column 2) convey, with comparatively few exceptions, opinions that registration is very fairly complete—in the more settled countries at least. Registration of births is, perhaps, on the whole less complete than that of deaths, and that such should be the case is probable from the apparent lack of facilities for tracing births. Registration of births is admittedly incomplete in the majority of the individual States of the United States of America.* Further registration both of births and deaths is incomplete in countries having a coloured population (cf. India, Orange Free State, &c.).

III. STILL-BIRTHS.

Tables C and D contain the replies received with reference to the registration of still-births, and a list of countries where such registration is not required by law has already been given (page 30). The majority of laws of the countries in that list have evidently been framed on the English model.

Where the registration of still-births is in force it is, with comparatively few exceptions, required under the general law relating to the registration of births, such laws having been drafted in general terms (*i.e.*, they require the registration of *all* births, or the birth of *every* child, and not merely the birth of every *living* child, as in England). It is noteworthy that so far as can be ascertained no legislature has, up to the present, enacted any definition of still-birth, and that the only guidance afforded to those required to declare and inscribe such births is that afforded by regulations made by the various statistical offices. Particulars of some of those regulations are given in the notes to Table D, and it will be convenient to set out here the more important of such regulations to facilitate comparison.

Regulations as to still-births.

(1.) *England and Wales.*—No record of still-born children may be made in a register of births or deaths. Even when an inquest

* See reply from the Census Bureau, U.S.A., p. 81.

has been held and when, according to the finding of the jury, the child was still-born, or there was not sufficient evidence to prove that the child was born alive, no record may be made. But if a child be born alive, it matters not how soon it may die, both the birth and the death must be registered. A child is deemed to be still-born when after being completely born it has not breathed or shown any sign of life. The term "completely born" is understood to indicate complete *expulsion* from the body of the mother, independently of complete *separation*.

(2.) *Austria*.—Registration is required only with respect to such children who, being born dead, have reached a development capable of independent existence. Non-viable children are regarded as abortions or miscarriages and the registration of their births is not required.

(3.) *Cape of Good Hope*.—The law relating to registration defines "birth" to mean and include "the birth of any *viable* child whether such child shall be living or dead at the time of birth."

By regulations, the following definitions are in force:—

"*Still-birth*"—the delivery of a formed child which has not shown any sign of life after complete birth.

"*Formed*"—any foetus at such a stage of development as to be readily recognised by any uninstructed person as a human child.

"*Complete birth*"—the body of the child is entirely outside the mother, but does not include either the division of the umbilical cord or the delivery of the afterbirth.

"*Sign of life*"—the child after complete birth has not been seen or heard to perform any physiological sign of life, such as breathing, crying, movement, pulsation or the like.

(4.) *Denmark*.—(Registration of still-births is not compulsory, but in practice almost universal.)—"Every foetus coming alive into the world is counted as a live birth, no matter what the duration of gestation may have been; and every foetus coming into the world without any sign of life during or after the 28th week of pregnancy is counted as a still-birth. An embryo expelled (*dead*) before the 28th week is reckoned as an abortion."

(5.) *Finland*.—Registration of still-birth is required for any foetus born dead after six months' gestation.

(6.) *France*.—The General Register Office counts as still-born all children issuing from the mothers' wombs without manifesting any sign of life and those who, born with signs of life, die before registration of birth. (As three days are allowed for registration, a certain number of children born alive appear in the registers as still-born.)

(7.) *Holland*.—Still-births include any of the following—

(a) children born prematurely and dead;

(b) full term children born without life; and

(c) children born alive, but dying before registration of birth (for which three days are allowed).

(8.) *Hungary*.—Children born after seven months' gestation without signs of life are registered as still-born, those born earlier are ignored.

(9.) *Italy*.—Infants dying *in utero* or during birth are deemed to have been born dead; all other, born alive. A child born alive, but dying before registration of birth is, *at law*, still-born, but for statistical purposes is counted as a “live-birth.”

(10.) *Japan*.—Registration of a foetus born after four months' gestation is required.

(11.) *Prussia*.—Still-births are to be declared if—

(a) of full-term children born dead;

(b) of embryos born after six (6) months' gestation which are more than 32 cm. in length; and

(c) of embryos which closely approximate to the conditions given in (b).

No official cognisance is taken of embryos which are definitely outside all of the above descriptions.

(12.) *Spain*.—Still-born children include those born without signs of life and those born alive but dying within the first twenty-four hours after birth.

(13.) *Switzerland*.—A still-born child is one dead before birth or dying during birth. Any child which has breathed after separation from the mother is held to have been born alive.

(14.) *United States of America*.—The following rules have been adopted by the American Public Health Association (*see* “Mortality Statistics, 1909,” Bulletin 108, Bureau of Census):—

17. For registration purposes, still-births should include all children born who do not live any time whatever, no matter how brief, after birth.

18. Birth (completion of birth) is the instant of complete separation of the entire body (not in the restricted sense of trunk, but the entire organism, including head, trunk and limbs) of the child from the body of the mother. The umbilical cord need not be cut nor the placenta detached in order to constitute complete birth for registration purposes. A child dead or dying a moment before the instant of birth is a still-birth, and one dying a moment, no matter how brief, *after* birth was a living child and should not be registered as a still-birth.

From the above the following points emerge for consideration:

(a) The great diversity in the period of gestation after which a foetus is to be registered as a still-birth, being as early as the end of the fourth month and as late as the ninth.

This want of uniformity is of no importance except in studies of fertility which take count of still-births. In such cases it is evident that a comparison of the rate for a country (such as Japan) where registration is required for any product of pregnancy which has lasted sixteen weeks with that of a country (such as Austria) where only still-births after 28 weeks are registered, will be entirely misleading. The difficulty could be obviated by a separate tabulation of still-births, such tabulation to give the numbers of children born during each week or month of pregnancy subsequent to the earliest date at which registration is required.

(b) The absence of any prescribed “sign of life.” This is, probably, the more serious defect in the regulations, and one which

requires to be rectified as speedily as possible. The fact that no rule on this point has (so far as is known) been universally, or even generally, adopted should facilitate the adoption of an international rule.

(c) In Belgium, France, Holland and Spain, where children whose births are registered with the endorsement "Presented dead" are legally regarded as still-born, "still-births" include a proportion of children born alive but dying before registration. The confusion thus created was the subject of comment by the late Mons. Bertillon in his article "*Mort-né*" (*Dictionnaire Encyclopédique des Sciences médicales*), who gave to the children dying before registration of birth the designation of "*dits mort-nés*." Having regard to the relatively high mortality among children during the first days of life, it is manifest that the exclusion of the *dits mort-nés* from infantile mortality rates will much understate those rates in comparison with rates based upon deaths which include all children born alive no matter how brief a time they live. Certain offices do endeavour to provide means of making the necessary corrections for the inclusion of *dits mort-nés* among the *mort-nés*, but not all. In Belgium registrars are directed to make inquiries, not prescribed by law, as to whether the children "presented dead" were born alive, and if so at what age they died. Such inquiries are for statistical purposes only, the law directing that such births are to be endorsed as "presented dead" without raising any presumption of live or still birth (in the true sense of the word). There can be no doubt that, if the practice alluded to cannot be changed, inquiries such as are made in Belgium should be universal and their results included in the official statistics. The better plan, however, would be to alter the law so as to limit registration of "still-births" to children actually born dead.

It will be seen from Table C that the practice as to the register in which still-births are recorded is very various. In fact, all possible combinations between the three sorts of registers which can possibly be used (viz., those of births and deaths and separate books) will be found in that table. It does not appear to be very material what registers are used, so long as statistical tabulation is uniform.

The conclusions which can be drawn from what has been written in this section are—

- (1.) That it is desirable that an international definition of "still-birth" should be adopted;
- (2.) That still-births should be registered; and
- (3.) That where the definition of "still-birth" does not exclude from such category the births of children born alive but dying before registration, official inquiries should be instituted on the occasion of registration with a view to discriminating between such form of pseudo still-birth (Bertillon's *dit mort-né*) and the genuine (*mort-né*).

The Chairman has prepared the following suggestions with reference to definitions of the terms "still-birth" and "still-born" which the Committee think may serve as a useful base for future discussion.

Memorandum on the Definition of "Still-Birth."

The standard of infantile mortality which has been almost universally adopted is the ratio of deaths during the first year of life to births, and for present purposes that will be taken as the meaning of the term. Such being the case, it is evident that it is necessary to enquire what meanings are to be given to the phrase "deaths during the first year of life" and to the word "birth." Stated shortly, the problem for consideration is—How should still-births be treated? Should they be excluded entirely from all calculations of infantile mortality, or should they be counted as births and deaths? To answer such questions it appears to be necessary to arrive at definitions of the terms "still-birth" and "still-born." It is somewhat remarkable that the Legislature of this country has not prescribed any test of still-birth, nor framed any definition of "still-born." In the Notification of Births Act, by which the declaration of births of still-born children is enacted, such children are referred to simply as "born dead."* Even in countries where still-births are registered as part of the usual routine, no legal definitions exist, only departmental regulations. As a rule the need of a definition being included in the Registration Law is obviated by enacting that "every birth" (or the "births of all children") shall be registered without making any distinction between children born alive and those born dead. It has, therefore, been deemed desirable for the present purpose to arrive at definitions of "still-birth" and "still-born" *ab initio*.

In popular language a "still-birth" means a "birth of a dead child." When an attempt is made to express that interpretation in strictly scientific language, difficulties are at once encountered as to the connotations of the three principal words, viz., "birth," "child," and "dead." Some form of definition, or descriptive paraphrase, is needed for each of those words.

What then is to be understood by the word "child"? Is it to be applied to every product of pregnancy without regard to duration of the latter? Or should it be limited to a fœtus which has attained a stage of development which will enable it to maintain an existence apart from the maternal tissues? Such questions involve points of law and medicine, as well as others having relation to the objects of registration and statistics.

"Life," according to the Law, "begins as soon as an infant is able to stir in the mother's womb" (Blackstone, 9th edition, i, p. 129). Such first movement, the "quickening," takes place in the fourth month of gestation, but the fixing of a date for the beginning of "life" does not prevent induced abortion at an earlier date, other than that justified on medical grounds, from ranking as criminal. If the registration of still-births be urged for purely legal purposes, viz., the prevention of criminal abortion, the term "child" used in the

* The rule of the Central Midwives Board, which has been adopted recently by the Registrar-General for the guidance of registrars, only prescribes that a child is to be deemed "still-born" if after complete birth it "has not breathed or shown any sign of life." There is no definition of "sign of life."

popular paraphrase of "still-birth" ought to include every product of healthy pregnancy.

The physician seeking evidence of life *in utero* is accustomed to rely most on the auscultation of the foetal heart sounds. He does so because it is not always possible to distinguish with certainty between muscular movements in the mother's body and foetal movements. Further foetal movements may be absent for long periods of time and yet the child be alive and healthy. Under the most favourable circumstances the foetal heart sounds can be heard as early as the 15th-16th weeks of pregnancy, *i.e.*, during the latter half of the fourth month of gestation. From that time onwards the sounds can be heard, presuming the foetus to be alive, with increasing facility. It would, therefore, appear to be preferable—and, possibly, more logical—to date foetal "life" from the time when the heart sounds become audible. There is another reason for taking the heart sounds as the test which will become evident later on.

A foetus may be born alive but be incapable of independent existence. A child (or foetus) born in such a condition is not worth considering as an addition to the population and has no interest to the statistician except he be dealing with problems of "complete" human fertility. It is necessary, therefore, to decide after what period of uterogestation a foetus may be expected, as a rule, to emerge in a viable condition, *i.e.*, capable of independent existence. Common experience teaches that a foetus "born" before the conclusion of the fifth month of gestation rarely lives more than a few minutes, that a foetus born during the next ensuing month can be reared, but with great difficulty, but from the end of that month onwards the chance of survival steadily improves. By medical men a "child" is regarded as viable from the middle of the seventh month of pregnancy, and it is not usual to induce labour, when the life of the child is to be preserved, prior to the twenty-sixth or twenty-seventh week of gestation. It should be noted here that the Notification of Births Act does not require the birth of a dead child which takes place earlier than the twenty-eighth week of pregnancy to be notified.

It would seem, therefore, to be justifiable to limit the word "child" to the product of conception "born" not earlier than the twenty-eighth week of development.

In loose phraseology a child is "dead" when it shows no signs of life, and the next question is what physiological or other function or functions is or are to be taken as "sign(s) of life." According to present legal practice a child is deemed to have "lived" when satisfactory proof has been adduced that the child has breathed (or cried) after birth. It is, however, well known to medical men that a child may be born "alive" but die without making any respiratory effort. Such a child can be "saved" by appropriate treatment, yet, if such treatment be not applied, either from ignorance or from deliberate intent, that child would have been, at law, born "dead." It is a cardinal principle in medicine that a person in whom the respiratory function is in abeyance can be resuscitated if the heart be acting, the chance of a successful issue

to efforts to resuscitate such person depending largely on the vigour of the heart's action. It appears, therefore, that some test other than respiration should be adopted to distinguish between "live" and "dead" new-born children.

Attention has already been directed to the importance of the heart sounds as evidence of life in a foetus *in utero*. Having regard to the uncertainties and the possibilities of error attaching to the respiratory test, as detailed above, it is suggested that the persistence of the heart's action should be made the test of "live-birth," and the absence of such action, of "still-birth." There is no difficulty in the application of such a test in every-day practice. The pulsations resulting from the heart's action can be readily felt (and seen, if strong) in the umbilical cord, and they can also be felt in the artery passing along the outer side of the foot just below the ankle bone—the pulse at the wrist in a new-born infant is too small to be felt except by a highly trained person. These tests are within the capacities of a competent midwife.

If then the words "showing no signs of life" be substituted for "dead" in the popular definition, the former words may be taken to mean that the child's heart has ceased to beat at the instant of time that the child comes under observation, *i.e.*, when it is "born." It remains then to determine when birth is complete.

The processes of labour are naturally divisible into four stages, more or less definitely demarcated. They are—

- (i.) Certain preliminary processes whereby the maternal tissues are rendered capable of passing the child out of the mother's body and the child is forced down into the pelvic cavity;
- (ii.) The actual expression or expulsion of the child from the body of the mother;
- (iii.) A period of (apparent) rest; and
- (iv.) The expulsion of the after-birth.

So far as the child is concerned the third and fourth stages form no part of its birth, which is completed as soon as the whole of the child's body is outside that of the mother. Neither the severance of the umbilical cord nor the expulsion of the after-birth are essential to the child's survival.

It may, therefore, be concluded that the time at which the test to distinguish between "live-birth" and "still-birth" is to be applied is the instant at which the last part of the child's body quits the body of the mother.

From the foregoing considerations it is possible to educe definitions of "still-birth" and "still-born"—perhaps they should be described as paraphrases, in scientific language, of the popular interpretations of the words.

A "still-born" child means a child born after a period of gestation of not less than seven lunar months (28 weeks) whose heart has ceased to function before the whole of the body (including the head and limbs) of such child has been completely extruded from the body of the mother; and

A "still-birth" means the birth of a still-born child.

It is conceivable that such definitions may not be acceptable to the legal profession, and that objection may be taken to the reliance placed upon the heart's action as a test of life, lawyers being accustomed to demand proof of the child having made the effort to breathe or of having cried. Against such objection it may be urged that the suggested definitions have not been deduced for legal purposes, but for use in the ordinary practice of obstetrics—mainly by midwives—and for the guidance of those concerned with the registration of births. When the onus of making a decision between live and still-birth rests with a medical practitioner, he will doubtless use other evidence to confirm or refute the conclusions which would have been otherwise based on the proposed test. Furthermore, there is no reason why the respiratory test should not be taken into consideration when so desired. Proof of the expansion of the child's lungs by the inspiration of air can only be obtained by post-mortem examination, which is no part of a midwife's functions. Moreover in prolonged labour a child may make a respiratory effort before the mouth is outside the body of the mother, and the child be thus "killed" before birth, *i.e.*, be still-born according to definition, and yet a respiratory act could be proved by witnesses present at the birth and by those making a post-mortem examination. Finally, it should be remembered that signs such as crying, breathing, &c., are impossible after the heart has ceased to beat, but the former may not be in evidence even when the heart is beating. Hence the heart's action ought to be taken as the test of life at the time of birth.

IV. STATISTICAL METHODS.

It was originally intended that this part of the report should be limited to the methods of calculating infantile mortality, but, having regard to the valuable information which has been communicated, it has been thought desirable to extend the survey to the methods of calculating the general rates of fertility and mortality. Before proceeding to the survey, it will be well to set out certain considerations, of a more or less elementary character, which ought to be kept in mind in examining statistical methods.

Whatever may have been the original aims and intentions of those who initiated the registration of births and deaths, there can be little room for doubt that at the present time the principal function of vital statistics, the natural outcome of registration, is the examination of the causes of unnecessary and preventable wastage of life and (but not to so general an extent) sickness. Vital statistics may, in effect, be regarded as taking the place of laboratory experiments in social physiology and pathology. If such views be accepted as correctly representing the functions of statistics, it is evident that reliable conclusions cannot be obtained unless the basic data are reliable and accurate, and the methods of calculations used by different inquirers uniform, or at least strictly comparable. In general terms the data available are (i) population, (ii) births, and (iii) deaths. The collection of data relating to population is outside the scope of this inquiry. Questions relating to the accuracy and

reliability of information (through registration) of births and deaths have already been dealt with, so there remains only the question of methods. In discussing the methods of calculating fertility, births will be considered as of one class only, the modifications required to meet the necessity of making adjustments for still-births being dealt with afterwards. The summary of replies received in relation to statistical methods will be found in Table E.

The first question for discussion is that of the period most suitable for the collation of statistics. The practice of issuing annual reports is almost universal. The question, then, arises should such reports be for a year of 365 (366) days, or one of 52 (53) weeks? An annual mortality rate, just as a rate per 1,000 persons, is a purely conventional symbol—an algebraic quantity—and, from the last sentence, it is evident that such symbol, or quantity, may have two values assigned to it in any year by different workers.

The next point is, should the totals of births (deaths) be the figures of the actual events occurring during the prescribed period? or should the registered numbers be used? It will be seen from Table E that in the majority of countries the latter practice prevails. Where births (deaths) occurring are relied upon, considerable delay is inevitable in publishing reports, and even after much delay to include belated declarations, a proportion of the events remain for interpolation in subsequent years. The result is that the published rates cannot be regarded as final until some time after their original issue.

From the above observations it is evident that there is a need of greater uniformity in the practice of calculating fertility and mortality rates, as it is only by the comparison of carefully estimated and adjusted rates that questions affecting the health and welfare of nations can be studied.

Infantile Mortality.—For the purposes of this report, infantile mortality has been defined as the ratio of deaths during the first year of life to births. Such is the usual basis of calculation, but in a few countries (*see* Table E) the estimated number living at ages under one year replaces the births. The ratio so obtained can only be described as most unsatisfactory and even illusory. The proper estimation of numbers living is laborious and the results unreliable. The commonest method of making such estimate is that depending on the number of the living at ages under one year as determined by the census expressed as a proportion of the population at all ages. Such method involves two sources of error—namely, that associated with all estimates of population during an intercensal period, and that arising from the assumption that the infants under one year of age form a constant proportion of the total population. In whatever manner the estimate be obtained, it appears to be undesirable to select such value (to which a large measure of uncertainty always attaches) for the determination of infantile mortality in preference to the number of births (a value to which a minimum of uncertainty attaches in countries where the registration of births is complete). It is very desirable that the

latter value should be universally used, a conclusion which entails a consideration of the proper treatment of the records of still-births.

The first point to be discussed is that of tabulation of such births. Should they form part of the total number of births or of deaths, or of both? All three systems appear to be in vogue, and the correct answer to the question depends to some extent on the object of any inquiry involving the use of the numbers of such births. If the complete fertility of women is being sought, then still-births (in the absence of all knowledge of the total number of conceptions) should be included with the "live-births." If it be desired to measure the mortality among children who have attained to life—which is not the same as the number born—then the still-births should be included among all births and all deaths (under one year of age). Lastly, if the mortality among children born alive only is wanted, then still-births should be excluded altogether. Such varied needs can only be met by the tabulation of still-births separately, such tabulation to be something more than a mere statement of numbers of each sex, if an identical international definition such as has been suggested is not adhered to.*

The conclusions to be drawn from the preceding paragraphs are:—

(1.) That still-births should be tabulated separately, such tabulation to include, *if necessary*,

- (a) the number of children born alive but registered as dead, and
- (b) the numbers born in each successive week or month after the prescribed (earliest) time for registerable still-births ;

(2.) That for general use the infantile mortality rate should be calculated from

- (a) the births of children born alive, including, *if necessary*, those born alive but registered dead, and
- (b) the number of deaths of children born alive during the first year of life, including, *if necessary*, the children "presented dead."

(Signed) REGINALD DUDFIELD (*Chairman*).
WILLIAM COSPATRICK DUNBAR.
SHIRLEY F. MURPHY.
C. P. SANGER.
T. H. C. STEVENSON.

June 20, 1912.

* A tabulation of still-births by causes thereof is to be found in the Swiss Annual Reports (*Mouvement de la Population de la Suisse*).

TABLE A.

	1	2	3	
			Within how many days after	
	Is the registration of births and deaths compulsory?	Date when registration came into force.	(a) a birth must registration be effected?	(b) a death must registration be effected?
<i>British Empire—</i>				
1a. England and Wales	Yes	1837 ¹	42 ²	5
1b. Ireland	Yes	1864	42	5 ³
1c. Scotland.....	Yes	1855	21 ⁴	8
1d. Gibraltar	Yes	1848, 1869 ⁵	21	24 hours.
1e. Malta.....	Yes	1862 ⁶	5	27
1f. Ceylon	Yes	1868 ⁸	42	5 ⁹
1g. Cyprus	Yes	1895	31	24, probably hours, but not so stated.
1h. Hong-Kong	Yes	1873	42	2
1j. India	Yes ¹⁰	"About 40 years ago" ¹¹	3—14	3—14
1k. Straits Settlements	Yes	1869	14	12 hours.
1l. Cape of Good Hope	Yes	1895	42 ¹²	36 hours. ¹³
1m. Gambia ¹⁴	Yes	1886	14 ¹⁵	14
1n. Mauritius	Yes	1736 ¹⁶	45	24 hours.
1o. Natal	Yes	1868	30 ¹⁷	30
1p. Orange Free State	Yes	1903 ¹⁸	28—90 ¹⁹	36 hours—90 days. ²⁰
1q. Sierra Leone.....	Yes ²¹	1857	42	5
1r. Transvaal	Yes	1900	7 ²²	24 hours ²²
1s. Alberta	Yes	1907	1 month ²³	"Before burial."
1t. Bermuda	Yes	1866	3 months	14
1u. British Guiana	Yes	1869	21	7
1w. Jamaica	Yes	1878	42	5
1x. Manitoba	Yes	1883	30	"Before interment."
1y. New Brunswick ..	Yes	—	30	10
1z. Newfoundland	Yes	1891	2	2
1aa. Nova Scotia	Yes	1908	10 ²⁴	48 hours. ²⁵

NOTES.

¹ *England and Wales*.—Not compulsory prior to 1875.² *England and Wales*.—"It is the parent's duty to secure registration within 6 weeks; births may be registered without payment up to 3 months, and on payment of a fee from 3-12 months. After 12 months the Registrar-General's written authority is necessary for registration and a higher fee is payable."³ *Ireland*.—Registration must be effected "within 5 days, unless written notice be given, accompanied by a medical certificate, then within 14 days."⁴ *Scotland*.—After three months warrant of Sheriff of County (*i.e.*, County Court Judge) necessary to effect registration.⁵ *Gibraltar*.—Registration of births, 1848; of deaths, 1869.⁶ *Malta*.—Registration required under Ordinance vi, 1862, which became operative January 1, 1863. Law re-enacted in Ordinance i of 1873.⁷ *Malta*.—"Acts of death are drawn up by the Police within 2 days and registered within the next 2 days." Registration of death is not required—
(a) in case of any individual on active list of H.M. Army or Navy, other than the Royal Malta Fencible Artillery, who are not natural born or naturalised Maltese or not married to a Maltese woman (natural born or naturalised); and

(b) in case of any individual dying on board any ship belonging to any foreign navy in any port of the Island.

- ⁸ *Ceylon*.—"Registration of births and deaths throughout the Island came into force in March, 1868, and of still-births (in towns) in 1897. Effective registration of births and deaths began in 1897."
- ⁹ *Ceylon*.—"In proclaimed towns:—before burial, *i.e.*, practically within 24 hours."
- ¹⁰ *India*.—Registration compulsory in municipal towns, the prescribed interval varying locally.
- ¹¹ *India*.—Registration was instituted in British India generally about 40 years ago, much later in certain areas. Some of the less accessible hill tracts and most of the Natives States are still outside the scope of registration.
- ¹² *Cape of Good Hope*.—In urban areas 42 days; in rural three months.
- ¹³ *Cape of Good Hope*.—In urban areas 36 hours; in rural, three months, certificate of cause of death compulsory in urban areas only.
(“Urban areas consist of every area within the limits of any municipality, borough, corporate town or village, management board and such others as the Governor may proclaim. A number of areas have been so proclaimed.”)
- ¹⁴ *Gambia*.—The colony of Gambia comprises—The Island of St. Mary, British Kommbo, the Ceded Mile, and McCarthy Island.
- ¹⁵ *Gambia*.—"Within 14 days after the birth of a child born in wedlock, and one calendar month after the birth of a child not born in wedlock."
- ¹⁶ *Mauritius*.—Registration established under law of Louis XV (of France).
- ¹⁷ *Natal*.—"The time allowed by law is 30 days. After this period a solemn declaration must be made. After six months from date of birth no registration is allowed except on payment of 1*l.* 1*s.* and authority of the Registrar-General."
- ¹⁸ *Orange Free State*.—In certain urban areas only in 1902, in whole Province in 1903. Not yet applied to coloured and native population.
- ¹⁹ *Orange Free State*.—28 days in urban areas; 90 in other parts.
(“Urban areas” include all towns and every village in which a registered medical practitioner is settled.)
- ²⁰ *Orange Free State*.—36 hours in urban areas; 90 days in other parts.
- ²¹ *Sierra Leone*.—Compulsory within city and suburbs of Freetown only, elsewhere permissive.
- ²² *Transvaal*.—In rural areas three months are allowed within which a birth or a death may be registered.
- ²³ *Alberta*.—"Owing to conditions in this new country it is allowed to register births within two years from date of birth without fee, and after two years with authority of Minister for a fee of 75 cents."
- ²⁴ *Nova Scotia*.—"Notification of the birth must be given by the medical practitioner attending at the birth within 10 days after the date of the birth to the District Registrar of the district in which the child is born. The parent or person standing *in loco parentis* is given 30 days after the date of the birth to file further particulars with the district registrar."
- ²⁵ *Nova Scotia*.—"The medical practitioner last in attendance must notify the district registrar within 48 hours. The occupier of the house in which the death took place must notify the district registrar immediately, and obtain from him a burial permit in cities and towns of the Province. In rural sections it is not compulsory to secure a permit, but notification of death—by the clergyman, minister, undertaker, sexton, or other person who buries—must be given within 7 days after the burial."

TABLE A—Contd.

	1 Is the registration of births and deaths compulsory ?	2 Date when registration came into force.	3 Within how many days after	
			(a) a birth must registration be effected ?	(b) a death must registration be effected ?
<i>British Empire—Contd.</i>				
1bb. Ontario	Yes	1869	30 ²⁶	— ²⁷
1cc. New South Wales	Yes	1856	60 ²⁸	" Before burial." ²⁹
1dd. New Zealand.....	Yes	1848	62 ³⁰	31 ³¹
1ee. Queensland	Yes	1856	60	30
1ff. South Australia ...	Yes	1842	42	10
1gg. Tasmania	Yes	1838	60	8
1hh. Victoria	Yes	1853 ³²	60	21
1jj. Western Australia	Yes	1841	60	14
2. Austria	Yes	1857	—	—
3. Bosnia and Herzegovina	Yes	1885	8	8
4. Belgium.....	Yes	1803 ³³	3	None fixed. ³⁴
5. Bulgaria.....	Yes	1880	7	Forthwith. ³⁵
6. Denmark	Yes	1687, 1800 ³⁶	2—8 ³⁷	— ³⁸
7. Finland	No ⁴⁰	1686	No	prescribed limit.
8. France	Yes	1803	3	None fixed. ³⁹
<i>German Empire—</i>				
9a. Alsace-Lorraine	Yes	1876 ⁴¹	7	24 hours. ⁴²
9b. Anhalt	Yes	1876	7	24 hours.
9c. Bavaria	Yes	1876	7	24 hours.
9d. Bremen	Yes	1876	7	24 hours.
9e. Hamburg ⁴³	Yes	1866	7	24 hours.
9f. Hesse	Yes	1876	7	24 hours.
9g. Lubeck	Yes	1811 ⁴⁴	7	24 hours.
9h. Prussia	Yes	1874	7	24 hours.
9j. Saxe Coburg-Gotha	Yes	1876	7	24 hours.
9k. Saxe Meiningen	Yes	1876	7	24 hours.
9l. Saxony	Yes	1876	7 ⁴⁵	24 hours.
9m. Wurtemberg	Yes	1871	7	24 hours.
10. Holland.....	Yes	1815 ⁴⁶	3	5
11. Hungary	Yes	1895 ⁴⁷	7	1—2 ⁴⁸
12. Italy	Yes	1866	5	0—24 hours.
13. Luxemburg	Yes	1778 ⁴⁹	3	None prescribed. ⁵⁰

²⁶ Ontario.—A medical practitioner attending at a birth is to give notice of the birth to the registrar "forthwith." The period of 30 days is time allowed for "notice" to be given to the registrar "in the prescribed form" by the father or other prescribed person.

²⁷ Ontario.—To be effected "immediately or before burial."

²⁸ New South Wales.—Registration can be effected after 60 days but within six months "on signing a declaration containing the particulars of birth." Parents settling in New South Wales can register the birth of a child born at sea or elsewhere than in New South Wales, in the like manner, if the child be under 18 months old.

²⁹ New South Wales.—The "householder" is responsible for the registration.

³⁰ New Zealand.—Registration must be effected "within 62 days (inclusive of day of birth)." If registered after that period—but before expiration of six months—a fee of 5s. is charged. After the expiration of six months,

registration can be effected only if the defaulting person has been convicted before a magistrate, and the age of the child be less than two years.

[By the "Births and Deaths Registration Act" of 1908 the occupier of any house in which a child is born is compelled, under penalty not exceeding 5*l.*, to give notice of such birth to the Registrar within 72 hours of its occurrence and the registrar has to record such notice in a special register. Such notification is additional to registration.]

³¹ *New Zealand*.—"Deaths should be registered before burial, but must be registered within 31 days. There is, however, no limit to the time within which registration may be effected, as in the case of births."

[By the Act of 1908 the occupier of any house in which a death takes place, and every person present at the death—and the undertaker—are responsible for the registration of the death. Further, the police are required to inquire into and report to the registrar each death occurring in the district.]

³² *Victoria*.—The church records of baptisms, marriages and burials prior to 1853 are preserved in Register Office, having been called in by law.

³³ *Belgium*.—Births and deaths registered under laws of March, 1803; still-births, July, 1806.

³⁴ *Belgium*.—Registration usually effected within 24 hours.

³⁵ *Bulgaria*.—On day of death for natives, within 10 days for foreigners.

³⁶ *Denmark*.—Births and deaths, 1687; still-births, 1800. Complete statistics of births and deaths from 1734.

³⁷ *Denmark*.—For towns 2 days, elsewhere 8.

³⁸ *Denmark*.—No prescribed period, but burial is not allowed except on the production of the certificate of registration.

³⁹ *France*.—No period prescribed by law. In practice the death is usually registered within 24 hours.

⁴⁰ *Finland*.—Registration of births and deaths is effected by the clergy of the various denominations:—births, on baptism; deaths, on application for leave to bury.

⁴¹ *Alsace-Lorraine*.—Registration was previously in force under the French law of 1803.

⁴² *Alsace-Lorraine*.—Period extended to 48 hours if the day following the death is a Sunday.

[This applies to all (or nearly all) States within the German Empire.]

⁴³ *Hamburg*.—The "Freie und Hansestadt."

⁴⁴ *Lubeck*.—Registration was first established in 1811, under French law, but (as appears from the answers) has been brought into conformity with the German Imperial law of 1875—in certain details.

⁴⁵ *Saxony*.—Live-births have to be registered within a week, still-births (and deaths) within 24 hours, except when a Sunday intervenes.

⁴⁶ *Holland*.—Registration of still-births (*leventoos aangegeven*) established 1839.

⁴⁷ *Hungary*.—Prior to the civil registration established in 1895, registration was effected by the clergy.

⁴⁸ *Hungary*.—"On next working day."

⁴⁹ *Luxemburg*.—"Ordonnance du Concile de Trente. Edit de Marie-Thérèse du 6 août 1778. Législation française—Décret 20 Sept. 1792 resp. décret de l'Administration du Département des Forêts du 29 Mars 1796. Code civil."

⁵⁰ *Luxemburg*.—Burial can take place on the authority of the "officier de l'état-civil" only, which implies previous registration.

TABLE A—*Contd.*

	1 Is the registration of births and deaths compulsory?	2 Date when registration came into force.	3 Within how many days after	
			(a) a birth must registration be effected?	(b) a death must registration be effected?
14. Norway	Yes ⁵¹	1735 ⁵²	See note 50	"Without delay."
15. Roumania	Yes	1866	3	24 hours.
16. Spain	Yes	1870	3	24 hours.
17. Sweden	Yes	1686 ⁵³	42	None fixed. ⁵⁴
18. Switzerland	Yes	1874 ⁵³	3	—
19. Japan ⁵⁶	Yes	—	10	25
20. Egypt.....	Yes	1891 ⁵⁷	3	24 hours.
21. <i>United States—</i>				
21a. California	Yes	1905	5—10 ⁵⁸	"Before burial."
21b. Colorado	Yes	1907	10	"Before burial."
21c. Columbia.....	Yes	1819, 1853 ⁵⁹	4—11 ⁶⁰	2
21d. Connecticut	Yes	1884	7	4
21e. Indiana	Yes	1900	36 hours	"Immediately."
21f. Iowa	Births, No ⁶¹ Deaths, Yes	—	—	"Before burial." ⁶²
21g. Kansas	Yes	1911 ⁶³	10	None fixed. ⁶⁴
21h. Maine	Yes	1892	6	6
21j. Maryland	Yes ⁶⁵	1898	4 ⁶⁶	"Before burial."
21k. Massachusetts	Yes	1842	30 ⁶⁷	"Forthwith."
21l. Michigan	Yes	1897, 1906 ⁶⁸	10	"Before interment."
21m. Minnesota	Yes	1887 ⁶⁹	10	None prescribed. ⁷⁰
21n. Missouri	Yes	1910	10	"Before burial."
21o. Montana	Yes	1907	10	"Before burial."
21p. Nebraska	Yes	1904	24 hours	"Before burial."
21q. New Hampshire	Yes	1881	6	"Before burial."
21r. New Jersey	Yes	1848	5	"Before interment."
21s. New Mexico ⁷¹	Yes	<i>Circ.</i> 1906	10	36 hours.
21t. New York	Yes	1880	36 hours ⁷²	24 hours.
21u. North Carolina	Births, No Deaths, Yes	1909	—	3 ⁷³
21w. North Dakota	Yes	1907	3	"Before burial."
21x. Ohio	Yes	1908	10	— ⁷⁴
21y. Rhode Island (and Providence Plan- tation)	Yes	1853 ⁷⁵	— ⁷⁶	"Before burial."
21z. Texas	Yes	1909 ⁷⁷	5	5
21aa. West Virginia	Yes	1881	30	30
21bb. Wisconsin	Yes	1907 ⁷⁸	5	— ⁷⁹
22. Argentina	Yes	1886	3	24 hours.
23. Costa Rica	Yes	1888	40	24 hours.
24. Cuba	Yes	1884	40	24 hours.
25. Uruguay	Yes	—	10 ⁸⁰	24 hours.

⁵¹ Norway.—Registration of births of children born to parents belonging to the Established Church is effected by the parish clergyman performing the baptism. In the case of children born to parents not belonging to that Church (under 2 per cent. of the total children born), the births are to be reported to the clergy (of the special denomination) within one month under a penalty ranging from 1-5,000 kronen. Midwives are required, under a like penalty, to report births attended by them within 8 days.

⁵² Norway.—Registration of births and deaths dates from 1735, of still-births from 1797.

- ⁵³ *Sweden*.—Registration prescribed by ecclesiastical law in 1686, statistics date from 1749.
- ⁵⁴ *Sweden*.—Registration must be effected "before burial, and if the dead body cannot be found, as soon as possible."
- ⁵⁵ *Switzerland*.—Law passed 1874, rigorously enforced since 1876.
- ⁵⁶ *Japan*.—Not including Formosa, Corea, Saghalien, and, as regards still-births, Okinawe-ken.
- ⁵⁷ *Egypt*.—Amending Decree dated 1898.
- ⁵⁸ *California*.—Registration must be effected within five days by the physician, midwife or nurse attending confinement—10 days, by parent or next-of-kin, if no physician, &c., in attendance.
- ⁵⁹ *Columbia*.—Registration of deaths required since 1819, of births and still-births since 1853. Official records date from August, 1874.
- ⁶⁰ *Columbia*.—Registration to be effected not later than "on the Saturday first ensuing after the expiration of three secular days immediately following the date of birth."
- ⁶¹ *Iowa*.—There is no registration of births. Assessors, making annual house-to-house visitation, obtain particulars ("by no means accurate") of birth(s) since last visit, and report to Clerk of Courts. Transcripts of such returns are sent to State Registrar of Vital Statistics.
- ⁶² *Iowa*.—No burial can take place without a death certificate. Undertakers are required to "file" such certificates on or before the 5th of the month next ensuing. "A fairly accurate record of deaths is secured by this method."
- ⁶³ *Kansas*.—Registration established by Act which became operative on July 1, 1911.
- ⁶⁴ *Kansas*.—Registration of death must precede burial.
- ⁶⁵ *Maryland*.—Registration of births compulsory on midwives and physicians, but owing to obscure wording the law is not enforceable against the latter.
- ⁶⁶ *Maryland*.—Four days is the period prescribed for midwives, no time fixed for physicians.
- ⁶⁷ *Massachusetts*.—To be effected "by (*i.e.*, on or before) the 15th of the month following" the birth.
- ⁶⁸ *Michigan*.—Deaths, 1897; births, 1906.
- ⁶⁹ *Minnesota*.—Amending Act passed 1907.
- ⁷⁰ *Minnesota*.—Registration must precede burial.
- ⁷¹ *New Mexico*.—The information here given applies apparently to the City of Albuquerque only, registration being under "City Ordinance."
- ⁷² *New York*.—Amendment of law to extend time to three days now before Legislature.
- ⁷³ *North Carolina*.—Registration in force only in towns of 500 inhabitants and over.
- ⁷⁴ *Ohio*.—A "death must be registered before removal, burial or any disposition is made of the remains."
- ⁷⁵ *Rhode Island*.—Amendment Law dated 1911.
- ⁷⁶ *Rhode Island*.—Births to be reported by physician or midwife on or before the 5th day of month following.
- ⁷⁷ *Texas*.—Efficient legislation dates from March 23, 1911.
- ⁷⁸ *Wisconsin*.—Date of earliest legislation not given: "uniform law adopted October 1, 1907."
- ⁷⁹ *Wisconsin*.—"The death certificate must be filed and a burial permit be obtained before the body is interred or otherwise disposed of."
- ⁸⁰ *Uruguay*.—10 days in towns, 20 days in rural districts.

TABLE B.

	1	2	3
	What is the penalty for omission to register?	Do many births or deaths escape registration?	Is it possible to effect burial without proof of registration? If so, are there any other means of securing registration?
1. <i>British Empire</i> —			
1a. England and Wales	< £2*	"No reason to suppose that more than a very few births and extremely few deaths"	Yes ¹
1b. Ireland	< £2	—†	Burial may precede registration, but notice must then be sent to the Registrar within 7 days, under penalty
1c. Scotland.....	£1—2	Not so far as is known	Yes ²
1d. Gibraltar	Births, < £1 Deaths, < £10	No	— ³
1e. Malta	Births, < £5, or < one month‡	"Rarely occurs"	No ⁴
1f. Ceylon	Deaths, none Fine and imprisonment ⁵	Not since 1897	— ⁶
1g. Cyprus	None	"Probably yes in remote villages"	Yes; no means
1h. Hong-Kong	Births, \$1—5 Deaths, \$200	No	No
1j. India	Fine usually 10 rupees	Yes ⁷	Yes ⁸
1k. Straits Settlements	\$1	Not many	"Hardly possible"
1l. Cape of Good Hope	< £2	Yes ⁹	Yes ¹⁰
1m. Gambia	< £5, or < 3 weeks	Not in Island of St. Mary. In other parts probably	Island of St. Mary, no; elsewhere, yes
1n. Mauritius	Births, 100 Rs. ¹¹ Deaths, 500 Rs.	— ¹²	No
1o. Natal	< £5	Yes ¹³	Yes ¹⁴
1p. Orange Free State	< £2	Yes ¹⁵	Yes ¹⁶

* This is to be read as "a fine not exceeding £2."

† This means question not answered, or, if with reference number, answer given under "Notes."

‡ This is to be read as "a fine not exceeding £5, or imprisonment for a term not exceeding one month."

NOTES.

¹ *England and Wales*.—If the body of a deceased person is buried without production of proof of registration, or proof that the registrar has been informed of the death, the burial must be notified to the registrar. A body may not in any circumstances be buried as still-born without production of a certificate or declaration of still-birth made by some person authorised thereto by Statute.

² *Scotland*.—Notice of burial without registrar's order has to be given to registrar within three days (under a penalty not exceeding 1*l.*). That requirement does not apply to still-births.

- ³ *Gibraltar*.—"In the case of deaths, registrar's certificate of registration or Coroner's order must be produced; and, as regards still-births, a certificate from the medical attendant or a declaration by father, mother, occupier of house, persons present at the birth, or person having charge of the child, to the effect that child was not born alive."
- ⁴ *Malta*.—No burial allowed without permits from the police and sanitary authorities. Permits are issued only on production of medical certificate attesting death and the cause thereof.
- ⁵ *Ceylon*.—If proceedings are taken in a police court, conviction entails a fine not exceeding 100 rupees, if in a higher court, imprisonment and fine.
- ⁶ *Ceylon*.—Burial without proof of registration is "not possible in proclaimed towns, *i.e.*, all the towns in the Island (31 in number), the registrar's certificate being required before burial. In other parts of the Island registration of death is secured by means of village headmen's reports to registrars. Still-births are not required to be registered in such places."
- ⁷ *India*.—The natives are in doubt as to the object of registration, and they shrink from publicity in domestic affairs, particularly with respect to births. A serious attempt is seldom made to enforce the law.
- ⁸ *India*.—"Proof of registration of death is not necessary before burial, cremation, &c. The agents for reporting such occurrences (burials) are for the most part illiterate village watchmen or town police."
- ⁹ *Cape of Good Hope*.—Omissions to register are more numerous in case of births than of deaths, and both are more numerous in rural than urban areas, and among coloured than white people. "In the purely native districts very little reliance can be placed upon the registration" returns.
- ¹⁰ *Cape of Good Hope*.—In urban area a body (by Act, any human dead body including that of a still-born child) cannot be buried without permit under penalty of 10*l*.
- ¹¹ *Mauritius*.—There is a fine of 100 rupees for failing to declare a birth within three months and one of 500 rupees (or imprisonment for not more than six months) for disposing of a dead body with the previously obtained permit of the "Officer of the Civil State."
- ¹² *Mauritius*.—"A few births; no deaths except in special circumstances such as epidemics or big cyclones, but such deaths are gradually registered later on in virtue of magistrates' orders."
- ¹³ *Natal*.—"More particularly in respect of the coloured population, ignorance of the law being pleaded as the excuse."
- ¹⁴ *Natal*.—"Yes, but the person performing the burial service is required to give notice of the fact to the registrar of deaths, the penalty for neglect being a fine not exceeding 10*l*."
- ¹⁵ *Orange Free State*.—"The percentage of births and deaths in rural areas (not registered) is, I think, considerable . . . It not uncommonly occurs in this Province that the first intimation of a birth is the request for a burial order and probably neither the birth nor the death would be reported but for the fact that burial cannot take place in urban areas without a burial order." Formerly the routine police patrol was used with success in rural areas. "The number of births registered during the last few years is decreasing despite the fact that the population is increasing."
- ¹⁶ *Orange Free State*.—In urban areas, which include every town and village where a registered medical practitioner is settled, no dead body—including that of a still-born child—can be buried without a permit issued by the deputy (district) registrar after requirements as to registration have been complied with. In other parts burial may take place without such permit. The "rural assistants" to the deputy registrar report burials to him.

TABLE B—Contd.

	1	2	3
	What is the penalty for omission to register?	Do many births or deaths escape registration?	Is it possible to effect burial without proof of registration? If so, are there any other means of securing registration?
1. <i>British Empire</i> —Contd.			
1q. Sierra Leone	< £2 in City and Suburbs only	Not so far as is known	Yes ¹⁷
1r. Transvaal	< £10, or < one month	No	Yes ¹⁸
1s. Alberta	\$1—50	Yes ¹⁹	Yes ²⁰
1t. Bermuda	< £5, or < 60 days	A few illegitimate births are concealed	Yes; no certificate of cause of death or proof of registration is required before burial
1u. British Guiana	< \$5	"Only a small percentage"	Yes ²¹
1w. Jamaica	< £2	No	Yes ²²
1x. Manitoba	< \$25	No ²³	"Not legally"
1y. New Brunswick	\$1—20	"Returns valueless"	"Not covered by Act"
1z. Newfoundland	\$10	"Probably 2 percent."	Yes ²⁴
1aa. Nova Scotia	\$10	No ²⁵	Yes ²⁶
1bb. Ontario	\$20	A considerable number of births (probably 10 to 20 per cent. in cities), but probably not more than 5 per cent. of deaths are not registered	No
1cc. New South Wales	£10	"No deaths escape registration, and the number of births not registered is infinitesimal"	Yes ²⁷
1dd. New Zealand	< £10	Very few births; practically no deaths	Yes ²⁸
1ee. Queensland	£10	"No" ²⁹	Yes ³⁰

See footnotes *, †, ‡ on p. 52.

¹⁷ *Sierra Leone*.—Registration is effected after burial, notice to register within five days being served on the person responsible.

¹⁸ *Transvaal*.—No burial may take place in an *urban* area without an order authorizing burial. Custodians of burial places must send in returns of burials at the end of each month. It is not compulsory to produce a burial order at a burial in a *rural* area.

¹⁹ *Alberta*.—"In new districts there are many. When registrars are appointed to such districts they are asked to gather up, as far as possible, registration of events prior to their appointments."

²⁰ *Alberta*.—Legally a "certificate of registration must be obtained and handed to the cemetery caretaker before interment, but it is provided that in remote districts where the distance from the registrar renders this (*i.e.*, the obtaining of the certificate of registration) impracticable, a body may be

interred, it being then incumbent upon the clergyman, or other person performing the funeral ceremony, to make a return of the death to the nearest registrar."

- ²¹ *British Guiana*.—In Georgetown, certificate of registration must be issued prior to burial. In other parts such certificate is not essential. There is no machinery to secure registration of deaths where burials take place without permit.
- ²² *Jamaica*.—"On registering a death the registrar gives a certificate of registration to the informant to be handed to the person who buries the body. Should that person not receive such a certificate, he is bound, under a penalty of 10l., to give notice in writing to the registrar within seven days after the burial."
- ²³ *Manitoba*.—Up to 1911 about 15 per cent. of the births were not registered but practically all deaths. Both births and deaths are now fully registered.
- ²⁴ *Newfoundland*.—Burial without production of proof of registration of death or of still-birth is possible "in isolated places, but in some cases a report of the burial is received later and the death is registered, also the birth, if not previously registered."
- ²⁵ *Nova Scotia*.—"We believe we are securing registration of all the deaths and that not many births are escaping the registrar's notice."
- ²⁶ *Nova Scotia*.—See note (25), Table A.
- ²⁷ *New South Wales*.—Burial can be effected on an order signed by a registrar, or by a coroner, or by a justice of the peace, or on a medical certificate of death being produced to the undertaker. The undertaker forwards certificate of burial to the registrar.
- ²⁸ *New Zealand*.—Burial may be effected without proof of registration of death. After every burial, undertaker is required (under penalty) to forthwith send to the registrar a certificate of burial in prescribed form, to which the signatures of the officiating minister and two "respectable" householders present at the funeral must be appended.

In the case of still-born children burial cannot take place except on production of a coroner's order, certificate of still-birth issued by a medical practitioner, or statutory declaration by some person who would have been liable to register the birth if the child had been born alive.

- ²⁹ *Queensland*.—"Officers in charge of police stations throughout this State are, except in a few instances, assistant district registrars of births and deaths, and as it is an important part of the police duty to make themselves acquainted with events in their districts, the fact of a birth or a death escaping their notice is reduced to a minimum. They, moreover, receive a fee of one shilling for each birth or death certificate forwarded to a district registrar, an additional inducement not to allow any birth or death to escape record."
- ³⁰ *Queensland*.—"Deaths need not necessarily be registered before burial. The great majority are so registered. In some of the rural portions of this State such provision, if existing, would unavoidably be inoperative. A check against non-registration of deaths when burial has taken place prior to registration is secured by the obligation on the undertaker and officiating minister to furnish certificates (of burial) to the district registrar and by cemetery regulations prohibiting burial except on the district registrar's certificate that registration has been effected. With these safeguards very few deaths escape record. This is, however, a weakness in our Act."

TABLE B—*Contd.*

	1	2	3
	What is the penalty for omission to register?	Do many births or deaths escape registration?	Is it possible to effect burial without proof of registration? If so, are there any other means of securing registration?
1. <i>British Empire</i> — <i>Contd.</i>			
1ff. South Australia ...	< £10	"No"	Yes ³¹
1gg. Tasmania	£10 for wilful neglect, 5s. for accidental omission — proved on declaration	"Very few births; not many deaths"	"Not legally possible"
1hh. Victoria	< £10	A small proportion of births (probably 2 per cent. at most), but practically no deaths	Yes ³²
1jj. Western Australia	£2—20	"No; probably very few"	Yes ³³
2. Austria	2—200 kronen, or < 14 days	A few illegitimate births are concealed, and occasionally a death fails to be registered	No; registration of cause of death must precede burial
3. Bosnia and Herzegovina	Fine or imprisonment	"Possibly, but not to be supposed"	Yes; no burial order given. Threat of proceedings
4. Belgium	Births, 26—200 francs and 8 days Deaths, none provided	"Nearly all, if not all, registered"	Legally, no; burial permit being required ³⁴
5. Bulgaria	10—200 francs	"Registration steadily improving"	No
6. Denmark	Births, 2—20 crowns Deaths, none prescribed	"Practically none"	No
7. Finland	—	A few births of children whose parents belong to no legalised congregation	No; burial not allowed, except on permission of the "director of the parish." In towns, medical certificate of cause of death is required
8. France	Births, fine 16—300 francs and prison for 6—180 days Deaths, none prescribed	No	No ³⁵
9. <i>German Empire</i> —			
9a. Alsace-Lorraine	150 marks—prison	No	No
9b. Anhalt	150 marks—prison	No	Exceptionally ³⁶
9c. Bavaria	150 marks—prison	Very seldom	Exceptionally
9d. Bremen	Up to 150 marks, or imprisonment	"Practically none"	No
9e. Hamburg	150 marks—prison	No	No
9f. Hesse	150 marks—prison	Only exceptionally	Exceptionally
9g. Lubeck	2—3 marks ³⁷	No	No
9h. Prussia	150 marks—prison	Yes	No

- ³¹ *South Australia*.—Burials are effected before registration in some cases, but curators of cemeteries must report to registrars within 10 days the fact of no certificate of registration being produced.
- ³² *Victoria*.—If burial takes place without registration the undertaker is bound (under a penalty of 20*l.*) to forward burial certificate within three days to the District Registrar. As a rule, registration precedes burial.
- ³³ *Western Australia*.—When burial takes place without registration of the death, the person who buries the body or performs any funeral service or otherwise disposes of the body must forthwith notify the district registrar. (Penalty 2*l.*–20*l.*). Burial on coroner's order may precede registration of death.
- In the case of a still-birth, no burial of the body may take place unless authorised by certificate of medical practitioner, certified midwife or nurse, magistrate or police officer (not under rank of sergeant) after personal inquiry. Penalty 100*l.* or 6 months' imprisonment. If child be born at a place over 10 miles distant from any of the persons named, burial can take place without permit, but its occurrence must be reported to nearest police officer within fourteen days, under same penalty.
- ³⁴ *Belgium*.—It is possible to effect burial without proof of registration, but it is probably rare that such an event occurs. Any person so doing is liable to imprisonment (1 week—2 months) or a fine of from 26—300 francs.
- ³⁵ *France*.—Burial can only take place on the authority of the registration officer, which authority he cannot give until he has viewed the body after a lapse of 24 hours from the time of death.
- ³⁶ *Anhalt*.—Burial, except after issue of the registrar's permit, can only take place on the authority of the chief police officer of the district, who must, forthwith, report the granting of such authority to the registrar. Unauthorised burial renders the sexton liable to a penalty not exceeding 30 marks. [The foregoing regulation appears to be in force (negative replies elsewhere entered notwithstanding) in all the States constituting the German Empire.]
- ³⁷ *Lubeck*.—The smallness of the penalty is exceptional, and is probably a relict of the French Law of 1811. In other German States the penalty is 150 marks or imprisonment.

TABLE B—Contd.

	1	2	3
	What is the penalty for omission to register?	Do many births or deaths escape registration?	Is it possible to effect burial without proof of registration? If so, are there any other means of securing registration?
9. <i>German Empire</i> —Contd.			
9j. Saxe Coburg-Gotha	150 marks—prison	None	Exceptionally
9k. Saxe Meiningen	150 marks—prison	No	Exceptionally
9l. Saxony	150 marks or prison	No	No
9m. Wurtemberg	150 marks—prison	Only isolated cases such as undetected infanticide	No
10. Holland	<100 guilders	No	No; burial permit necessary
11. Hungary	600 crowns	"Only very few"	Exceptionally by special permit of the "local board"
12. Italy	10—200 liras	No	No ³⁸
13. Luxemburg	26—200 francs and (or) imprisonment for 8—180 days	No	No
14. Norway	Births, see note ⁽⁵⁰⁾ , Table A	"Several births, few deaths"	No
15. Roumania	Deaths, 1-5,000kronen	No	No ⁴⁰
	Fine or imprisonment ³⁹	No	No
16. Spain	5—10 pesetas	—	No
17. Sweden	Births, fine	No	No
	Deaths, none		
18. Switzerland	100 francs	4 or 5 births a year, perhaps ⁴¹	No
		No deaths	
19. Japan	10 yen	Exceptionally	No
20. Egypt	£E25—100	"Not in towns"	No
21. <i>United States</i> —			
21a. California	"Punishment for misdemeanour"	A few ⁴²	"Not legally possible"
21b. Colorado	\$5—50	—	No; permit required, fine \$20—100, if burial without permit
21c. Columbia	<\$200 and or 90 days ⁴³	Births, 5—10 per cent. Deaths, 0	Not legally, except still-births 0—5 months' gestation
21d. Connecticut	Births, \$10 ⁴⁴ Deaths, —	Births, about 10 per cent. Deaths, "few, if any"	No ⁴⁶
21e. Indiana	\$10—50 ⁴⁵	1—2 per cent.	Legally—No ⁴⁷
21f. Iowa	—	Yes ⁴⁸	No ⁴⁹
21g. Kansas	\$5—50	(Law became operative this year only)	No; burial permit necessary
21h. Maine	<\$100	Births, 10—15 per cent. Deaths, 0—5 percent.	Illegal, and very rare

See footnotes *, †, ‡ on p. 52.

- ³⁸ *Italy*.—Burial cannot take place without the order of the registration officer, and that order is not issued until the death has been registered and the cadaver inspected by the "*medico necroscopo*" (médecin verificateur).
- ³⁹ *Roumania*.—After three days, registration can only be effected by order of a court of law.
- ⁴⁰ *Roumania*.—Any person burying a body without the prescribed permit of the statutory officer is liable to imprisonment for a term varying from 2 weeks to 2 months.
- ⁴¹ *Switzerland*.—On an average 4 or 5 births fail to be registered in the course of a year. The parents of such children generally reside in isolated villages far from the Registration Offices. Such omissions are discovered when the children are first sent to school (production of certificate of birth being demanded on admission to school) or (occasionally) on the registration of death in a child under 7 years of age.
- ⁴² *California*.—"Hardly any deaths escape registration, but birth registration is probably incomplete, especially in unsettled or sparsely settled rural districts."
- ⁴³ *Columbia*.—For omission to register a birth (or death), "fine not exceeding \$200 or imprisonment not exceeding 90 days, or both, and each week's delay after expiration of time limit constitutes a separate and distinct offence."
- ⁴⁴ *Connecticut*.—The physician or midwife is liable to be fined for not reporting a birth. No fine or other penalty prescribed for parent who fails to register a birth.
- ⁴⁵ *Connecticut*.—It is unlawful to bury any body until a burial permit has been issued which can only be done after the death certificate has been filed. No body can remain unburied more than four days. There is no other machinery for securing registration of deaths and still-births.
- ⁴⁶ *Indiana*.—Registration of death *apparently* the duty of doctor or midwife, as in addition to the liability to fine mentioned, it is stated that "the bill for professional service is null and void."
- "In addition to the liability to fine for non-registration of death the body may be disinterred and an inquest held, the cost of the inquest falling on the person who failed to register the death."
- ⁴⁷ *Indiana*.—See preceding note.
- ⁴⁸ *Iowa*.—"There are many children born whose parents leave the State before the assessor makes his annual visit. Undoubtedly in many of the country districts bodies are buried without conforming to the law. Most of the cities and towns, where there are licensed embalmers, make good reports."
- ⁴⁹ *Iowa*.—No body is permitted to be buried without production of a death certificate. Undertakers are compelled by law to file all death certificates on or before the 5th day of each month for deaths which have occurred during the preceding month. No other means of securing registration.

TABLE B—*Contd.*

	1	2	3
	What is the penalty for omission to register?	Do many births or deaths escape registration?	Is it possible to effect burial without proof of registration? If so, are there any other means of securing registration?
21. <i>United States—Contd.</i>			
21j. Maryland	Births, \$5—25 ⁵⁰ Deaths, \$5—50	Births, about 40 per cent. Deaths, about 10 per cent.	"Not legally"
21k. Massachusetts	Births, \$10—25 Deaths, < \$50	Births, a few Deaths, none	No
21l. Michigan	Fine or imprisonment	"Not many"	Occasionally a still-birth ⁵¹
21m. Minnesota	Fine or imprisonment	"Undoubtedly some births, but fewer deaths"	No; burial permit necessary
21n. Missouri	\$5—50	Less than 10 per cent.	No ⁵²
21o. Montana	Births, \$10—25 Deaths, \$10—200	No	No
21p. Nebraska	"Fine"	"Some"	No
21q. New Hampshire	< \$100	A few births only	No
21r. New Jersey	\$50	Births, 0—20 per cent. Deaths, 0-1 per cent.	Legally, no; burial permit being required
21s. New Mexico	Births, \$100 Deaths, none	Yes ⁵³	No; death certificate from Health Officer necessary
21t. New York	Up to \$100 ⁵⁴	Births, 0-10 per cent. Deaths, "a few"	Legally, no; burial permit being required
21u. North Carolina	Deaths, \$5—50, ⁵⁵ or 10—30 days	"We think not"	No; permit required ⁵⁶
21w. North Dakota	Births, \$5—50 Deaths, \$20—200	Births, 25 per cent. Deaths, 10 per cent.	"In outlying districts the law evaded"
21x. Ohio	Births, \$5—50 Deaths, \$20—100	Births, 0-20 per cent. Deaths, "possibly a few."	No ⁵⁷
21y. Rhode Island (and Providence Plantation)	\$2—20	"Not many"	No ⁵⁸
21z. Texas	\$10—1,000	In State as a whole about 45 per cent. Yes	Yes, outside incorporated cities Yes
21aa. West Virginia	—	Births, 10 per cent. Deaths, 0	No interment can take place without burial permit issued after registration of death or still-birth
21bb. Wisconsin	\$20—200		
22. Argentina	10—100 pesos, or imprisonment	"Not any"	No
23. Costa Rica	1—25 colons (2—50s.)	Very rarely	—
24. Cuba	\$10 (minimum)	Births, very few Deaths, none	No
25. Uruguay	\$1—50 or 7—15 days' prison	No	No

See footnotes *, †, ‡ on p. 52.

- ⁵⁰ *Maryland*.—Alternatively imprisonment for not more than 30 days, or fine and imprisonment.
- ⁵¹ *Michigan*.—"Occasionally a still-born child is buried without registration of the death, but a check is kept by means of the certificate of birth, and a request to file the certificate always brings result."
- ⁵² *Missouri*.—See note ⁴⁶.
- ⁵³ *New Mexico*.—Many births and deaths escape registration owing to carelessness and inability to trace physicians. "On the whole (*efficiency of*) registration (*is*) really dependent on (*the*) activity of (*the*) Health Office."
- ⁵⁴ *New York*.—Actual limits of fines are fixed by the various local boards.
- ⁵⁵ *North Carolina*.—In addition to fine or imprisonment, any person failing to register a death is liable "to a penalty of \$25 in favour of any person who shall sue for the same."
- ⁵⁶ *North Carolina*.—"Law requires burial permit based on death certificate" before burial. "Still-births reported on death certificate blanks marked 'Still-births.'"
- ⁵⁷ *Ohio*.—"No, except in some country cemeteries which have no regularly appointed sextons. No means (of securing registration of deaths and still-births) other than the registration under the Vital Statistics Act."
- ⁵⁸ *Rhode Island*.—Burial permit has to be obtained by undertaker (registered embalmer) who must produce certificate of cause of death. Permit returned to registrar by the sexton, after the burial.

TABLE C.

	1	2	3
	Is the registration of still-births compulsory?	Are still-births registered as (a) births, (b) deaths, (c) both, or (d) in separate registers?	If a child be born alive, but die before registration, how is the case recorded?
1. <i>British Empire—</i>			
1a. England and Wales	No	—	As a live birth and a death
1b. Ireland	No	—	As a live birth and a death
1c. Scotland	No	—	As a live birth and a death
1d. Gibraltar	No	—	As a live birth and a death
1e. Malta	Yes	(a)	As a live birth and a death
1f. Ceylon	Yes ¹	(d)	As a live birth and a death
1g. Cyprus	No	—	As a live birth and a death
1h. Hong Kong	No	—	As a live birth and a death
1j. India	Yes	(d)	"As a viable child reported dead"
1k. Straits Settlements	Yes	(d)	As a live birth and a death
1l. Cape of Good Hope	Yes ²	— ³	As a live birth and a death
1m. Gambia	No	(c) and (d)	As a live birth and a death
1n. Mauritius	Yes ⁴	(d)	As a live birth and a death
1o. Natal	Yes ⁵	(c) and (d)	— ⁶
1p. Orange Free State	No ⁷	(d)	As a live birth and a death
1q. Sierra Leone	No	—	As a live birth and a death
1r. Transvaal	Yes	(d)	As a live birth and a death
1s. Alberta	Yes	(a)	As a live birth and a death
1t. Bermuda	Yes	(c)	As a live birth and a death
1u. British Guiana	Yes ⁸	(d)	As a live birth and a death
1w. Jamaica	No	—	As a live birth and a death
1x. Manitoba	Yes	(c) and (d)	As a live birth and a death
1y. New Brunswick	No	—	No rule prescribed
1z. Newfoundland	Yes ⁹	(c)	As a live birth and a death
1aa. Nova Scotia	Yes ¹⁰	(c)	As a live birth and a death
1bb. Ontario	Yes	(c) ¹¹	As a live birth and a death
1cc. New South Wales	No	—	As a live birth and a death
1dd. New Zealand	No	—	As a live birth and a death
1ee. Queensland	No	—	As a live birth and a death
1ff. South Australia	No	—	As a live birth and a death
1gg. Tasmania	No	—	As a live birth and a death
1hh. Victoria	No	— ¹²	As a live birth and a death
1jj. Western Australia	Yes ¹³	(c)	As a live birth and a death
2. Austria	Yes	—	—
3. Bosnia and Herzegovina	Yes	(d)	As a live birth and a death
4. Belgium	Yes ¹⁴	(b)	As "presented dead" ¹⁵
5. Bulgaria	Yes	(c) ¹⁶	Doubtful ¹⁷
6. Denmark	No ¹⁸	(a)	As a live birth and a death
7. Finland	No ¹⁹	(b)	As a live birth and a death
8. France	Yes ²⁰	(b)	As still-born ²¹
9. <i>German Empire—</i>			
9a. Alsace-Lorraine	Yes ²²	(b)	As a live birth and a death
9b. Anhalt	Yes	(b)	As a live birth and a death
9c. Bavaria	Yes	(b)	As a live birth and a death
9d. Bremen	Yes	(b)	As still-born
9e. Hamburg	Yes	(b)	As a live birth and a death
9f. Hesse	Yes	(b)	As a live birth and a death
9g. Lubeck	Yes	(b)	As a live birth and a death
9h. Prussia	Yes	(b)	As a live birth and a death

NOTES.

- ¹ *Ceylon*.—In proclaimed towns only.
- ² *Cape of Good Hope*.—By Section 2 of Act regulating registration, "birth" is defined to "mean and include the birth of any *viable* child, whether such child shall be living or dead at the time of birth." In urban areas every still-birth has to be reported within 36 hours on ordinary Birth Notification Form, and in addition a certificate by the practitioner or midwife, or a solemn declaration by some other person, has to be given that the child was not born alive. A burial permit is necessary. In rural areas still-births are ignored officially.
- ³ *Cape of Good Hope*.—Still-births are not entered on register but are used for statistical purposes.
- ⁴ *Mauritius*.—Registration of still-births dates from 1877. The penalty for omission to register is the same as that prescribed in connection with death. (See note 11, Table B.)
- ⁵ *Natal*.—The law as to "living born" applies to "still born."
- ⁶ *Natal*.—The answer "no special reference is made" appears to mean that such child is registered as "living born."
- ⁷ *Orange Free State*.—Every still-birth must be reported (penalty 2*l.*), to the Deputy Registrar. The records (as births and deaths) are kept in special registers.
- ⁸ *British Guiana*.—Subject to fine \$5-£50. The body of a still-born child cannot be buried except a medical certificate that child was not born alive be produced.
- ⁹ *Newfoundland*.—Not by special legislation. They are regarded as "births."
- ¹⁰ *Nova Scotia*.—Still-births are under the provisions of the Act relating to living births.
- ¹¹ *Ontario*.—They are entered in registers of births and of deaths, and "noted in a special column."
- ¹² *Victoria*.—Still births are not registered at all. They are "reported" (by whom not stated), to the local Registrars, who forward totals, without particulars, to the central office.
- ¹³ *Western Australia*.—Registration of still births dates from January, 1908, and is under the same penalty as that of live birth, but time for registration is 14 days only (not 60 as for living births). A still-born child is, for purposes of registration, deemed to have been born alive and to have died.
- ¹⁴ *Belgium*.—Declaration of birth is obligatory with reference to every child born subsequent to the sixth month of pregnancy.
- ¹⁵ *Belgium*.—The births of still-born children and of those born alive but dying before registration [the "presented dead" (*présentés sans vie*)] are entered in the death registers—in a special manner (*d'après une formule spéciale*). The entry does not state whether the child was really still-born or "presented dead," but the registration officers—for statistical purposes—enter notes on these points in separate registers.
- ¹⁶ *Bulgaria*.—"A la déclaration, dans un registre commun contrôlé par le Tribunal; puis dans des registres à part, envoyés par la Direction Générale de la Statistique du mouvement de la population."
- ¹⁷ *Bulgaria*.—"La loi n'est pas très précise—tout au contraire—sur ce point, mais la statistique du mouvement de la population tient compte si l'enfant est né vivant ou mort."
- ¹⁸ *Denmark*.—Although not prescribed by law the registration of still-births is generally recognised as compulsory.
- ¹⁹ *Finland*.—Registration of still-birth is not required, but burial permit is necessary.
- ²⁰ *France*.—If the sex can be determined.
- ²¹ *France*.—Strictly following the law, it should be registered doubly as a birth and as a death, but the general practice is to enter the case as a death only. Hence in official statistics there is a heading "Still-born and children dead before registration of birth."
- ²² *Alsace-Lorraine*.—The registration of still-births is subject to the provisions relating to deaths. This applies to the majority of the German States.

TABLE C—Contd.

	1	2	3
	Is the registration of still-births compulsory?	Are still-births registered as (a) births, (b) deaths, (c) both, or (d) in separate registers?	If a child be born alive, but die before registration, how is the case recorded?
9. <i>German Empire—Contd.</i>			
9j. Saxe Coburg-Gotha	Yes	(b) ²³	As a live birth and a death
9k. Saxe Meiningen	Yes	(b)	As a live birth and a death
9l. Saxony	Yes	(b)	As a live birth and a death
9m. Wurtemberg	Yes	(c)	As a live birth and a death
10. Holland	Yes	(d)	As "presented dead" ²⁴
11. Hungary	Yes	(a)	As a live birth and a death
12. Italy	Yes	(a)	As "dead" ²⁵
13. Luxemburg	Yes	(b)	As "presented dead" ²⁶
14. Norway	Yes	(d)	As a live birth and a death
15. Roumania	Yes	(b)	As still-born
16. Spain	No ²⁷	(d)	As a live birth and a death if surviving 24 hours
17. Sweden	Yes	(a)	As a live birth and a death
18. Switzerland	Yes ²⁸	(c)	As a live birth and a death
19. Japan	Yes ²⁹	(d)	As a live birth and a death
20. Egypt	Yes ³⁰	(b)	As a live birth and a death
21. <i>United States—</i>			
21a. California	Yes ³¹	(c)	As a live birth and a death
21b. Colorado	Yes	(c)	As a live birth and a death
21c. Columbia	Yes ³²	(d)	As a live birth and a death
21d. Connecticut	Yes	(d)	As a live birth and a death
21e. Indiana	Yes ³³	(c)	As a live birth and a death
21f. Iowa	Yes ³⁴	(b) ³⁵	As a live birth and a death
21g. Kansas	Yes	(c)	As a live birth and a death
21h. Maine	Yes	(d)	As a live birth and a death
21j. Maryland	Yes	(c)	As a live birth and a death
21k. Massachusetts	Yes	(c) and (d)	As a live birth and a death
21l. Michigan	Yes	(c) and (d)	As a live birth and a death
21m. Minnesota	Yes	(c)	As a live birth and a death
21n. Missouri	Yes	(c)	As a live birth and a death
21o. Montana	Yes	(c)	As a live birth and a death
21p. Nebraska	Yes	(d)	As a live birth and a death
21q. New Hampshire	Yes	(c)	As a live birth and a death
21r. New Jersey	Yes	(d)	As a live birth and a death
21s. New Mexico	No ³⁶	— ³⁷	As a live birth and a death
21t. New York	Yes ³⁸	(d)	As a live birth and a death
21u. North Carolina	No	(b) ³⁹	As a death only
21w. North Dakota	Yes ⁴⁰	(c) and (d)	As a live birth and a death
21x. Ohio	Yes ⁴¹	(c) and (d)	As a live birth and a death
21y. Rhode Island (and Providence Plantation)	Yes	(c) and (d)	As a live birth and a death
21z. Texas	Yes	(c)	As a live birth and a death
21aa. West Virginia	Yes	(c) and (d)	As a live birth and a death
21bb. Wisconsin	Yes ⁴²	(c)	As a live birth and a death
22. Argentina	Yes	(b)	If dead at time as registration of death, notwithstanding any evidence as to live-birth ⁴³
23. Costa Rica	Yes	(c) and (d)	As a live birth and a death
24. Cuba	Yes	(d)	As a live birth and a death ⁴⁴
25. Uruguay	Yes	(b)	As a live birth and a death

- ²³ *Saxe Coburg-Gotha*.—A distinction is made between (i) the true still-born (born dead), and (ii) the spurious (dying at or immediately after birth).
- ²⁴ *Holland*.—There is no distinction between still-births and children born alive and dying before declaration of birth, both being inscribed as "*levenloos aangegeven*" (présentés sans vie). It is *estimated* that somewhere about 15-20 per cent. of the children so entered were born alive.
- ²⁵ *Italy*.—If a child who was born alive be dead at the declaration (and registration) of birth, the birth is entered in the register of births with an endorsement "dead" but without any statement as to the child being live-born or still-born.

For statistical purposes, the Registrars record the results of inquiries to ascertain whether the child was "still-born" or died shortly after birth. Children dying after declaration of birth are dealt with in accordance with the law relating to death.

- ²⁶ *Luxemburg*.—On same system as in Belgium. [See note 14 *supra*.]
- ²⁷ *Spain*.—Registration of still-birth is not required, but burial permit is necessary.
- ²⁸ *Switzerland*.—After the sixth month of pregnancy.
- ²⁹ *Japan*.—Applies to children born after four months' pregnancy and is enforced to secure issue of burial order.
- ³⁰ *Egypt*.—This has not hitherto been specially provided for by law. In the law now under consideration it is proposed to provide:—
 "Tout décès, y compris les mort-nés de plus de six mois de gestation, morts avant ou pendant l'accouchement, doit être déclaré dans le 24 heures."
- ³¹ *California*.—Dealt with under the general law relating to "births."
- ³² *Columbia*.—If the fœtus be apparently (*one of*) five or more months' utero-gestation, otherwise registration is not required.
- ³³ *Indiana*.—Registration not required earlier than after the seventh month of gestation.
- ³⁴ *Iowa*.—"Registration is only secured through a death report, or burial certificate, if one be issued. Not definitely certain that death certificates are always issued. No penalty attached."
- ³⁵ *Iowa*.—Entered in register of deaths, and noted in column headed "still-births."
- ³⁶ *New Mexico*.—Omission of registration of still-births deemed to be due to bad wording of the law.
- ³⁷ *New Mexico*.—Burial of still-born children not possible in "legal cemeteries" without death certificate.
- ³⁸ *New York*.—See note 31 *supra*.
- ³⁹ *North Carolina*.—There is no registration of births or still-births, but the latter are entered on death registers as burial permits are necessary.
- ⁴⁰ *North Dakota*.—See note 31 *supra*.
- ⁴¹ *Ohio*.—See note 31 *supra*.
- ⁴² *Wisconsin*.—See note 31 *supra*. The registration of birth of a fœtus prior to fifth month of gestation is not required.
- ⁴³ *Argentina*.—Registration affords no evidence as to the child having been born alive or dead.
- ⁴⁴ *Cuba*.—Provided the child lives 24 hours, otherwise as a still-birth.

TABLE D.

	1 Is there any definition of "still-birth" or "still-born" or prescribed by law?	2 Has there been any judicial decision bearing upon the point? *	3 What is the interpretation adopted for registration purposes?
1. British Empire—			
1a. England and Wales	No	None known	"A <i>live-born</i> child for registration purposes is defined as one that lived (for however short a time) after complete expulsion from the body of its mother. All others are to be regarded as <i>still-born</i> "
1b. Ireland	—	—	—
1c. Scotland	No	No	— ¹
1d. Gibraltar	No	No	"A child who was not born alive"
1e. Malta	No ²	—	—
1f. Ceylon	Yes ³	No	That prescribed by law
1g. Cyprus	No	No	—
1h. Hong-Kong	Yes ⁴	No	—
1j. India	No	No	"A viable child reported to have been born dead"
1k. Straits Settlements	No	No	"When the child is not alive when born"
1l. Cape of Good Hope	No	No	— ⁵
1m. Gambia	No	No	"One which has died before delivery, <i>i.e.</i> , in its mother's womb"
1n. Mauritius	No	No	"Child of 7 months' gestation (or more) which died before delivery"
1o. Natal	No	No	"Child is dead on delivery"
1p. Orange Free State	Yes ⁶	No	—
1q. Sierra Leone	No	No	"Children that are born dead"
1r. Transvaal	Yes ⁷	No	—
1s. Alberta	No	No	"Born dead at full term"
1t. Bermuda	No	No	"A child born dead"
1u. British Guiana	No	No	"The birth of a child which, in the opinion of a medical practitioner was not born alive, that is, did not breathe"
1w. Jamaica	No	No	"A child who has had no separate life from that of its mother"
1x. Manitoba	No	—	"Still-birth is interpreted to mean that life was extinct immediately before delivery"
1y. New Brunswick	No	No	"Act does not provide for such"
1z. Newfoundland	No	No	"Dead at birth"
1aa. Nova Scotia	No	No	— ⁸
1bb. Ontario	No	No	"A child dead at birth"
1cc. New South Wales	No	No	"A child which has not breathed"
1dd. New Zealand	No	No	None
1ee. Queensland	No	No	— ⁹
1ff. South Australia	No	No	—
1gg. Tasmania	No	No	"Born without life"
1hh. Victoria	No	No	— ¹⁰
1jj. Western Australia	Yes ¹¹	No	— ¹²

* This question means decisions on subject of the definition of still-births for the purposes of registration.

NOTES.

- ¹ *Scotland*.—"If the child has lived, *i.e.*, had separate existence from its mother, and has breathed, both birth and death are recorded. Otherwise no entry falls to be made in the registers."
- ² *Malta*.—"There is no definition of 'still-birth' and 'still-born,' but the law gives certain directions.
 "Art. 320.—In the case of a still-born child such circumstance shall be stated in the act of birth.
 "If the child, having been born alive, shall have died at any time previous to the formation of the act of birth, the act of death shall be drawn up immediately after the act of birth."
- ³ *Ceylon*.—"The term 'still-birth' means a child born after the twenty-eighth week of gestation as dead, or apparently dead and not called back to life." Ordinance No. 1, 1895, Sec. 3.
- ⁴ *Hong-Kong*.—Law defines a still-born child as one "which was not born alive." Certificates and declarations relating to still-births have to state that "the child of.....which was born on the.....day of.....was not born alive." (Ordinance 7 of 1896.) Certificates are filed only.
- ⁵ *Cape of Good Hope*.—By the Regulations, "still-birth" is defined as "the delivery of a formed child which has not shown any sign of life after complete birth." By "formed" is meant "any fœtus at such a stage of development as to be readily recognised by any uneducated person as a human child."
 "Complete birth" means that "the body is entirely outside the mother, but does not include either the division of the umbilical cord or the delivery of the after-birth."
 "Signs of life" mean that "the child, after complete birth, has not been seen or heard to perform any physiological sign of life, such as breathing, crying, movement, pulsation or the like."
- ⁶ *Orange Free State*.—The definition is the same as that in force in Cape of Good Hope. (See note 5 *supra*.)
- ⁷ *Transvaal*.—See note 5 *supra*.
- ⁸ *Nova Scotia*.—"A 'still-birth' is a child born dead. If a miscarriage has taken place after the quickening period of gestation, the child is required to be recorded as a birth and a death."
- ⁹ *Queensland*.—For registration purposes the definition of a "living person" in connection with crime relating to homicide or concealment of birth, contained in Section 292 of the Criminal Code, is adopted. That section reads as follows:—"A child becomes a person capable of being killed when it has completely proceeded in a living state from the body of its mother, whether it has breathed or not, and whether it has an independent circulation or not, and whether the navel-string is severed or not."
- ¹⁰ *Victoria*.—A child is not recorded as "still-born" if it is alive immediately after birth, although death may occur within a few minutes.
- ¹¹ *Western Australia*.—"Still-born child" means any child of seven months' gestation or over not born alive.
- ¹² *Western Australia*.—For the purposes of the Registration Act (1894) a still-born child is "deemed to have been born alive and to have subsequently died."

TABLE D—Contd.

	1 Is there any definition of "still-birth" or "still-born" or prescribed by law?	2 Has there been any judicial decision bearing upon the point? *	3 What is the interpretation adopted for registration purposes?
2. Austria	—	—	—
3. Bosnia and Herzegovina	No	No	"The moment of leaving the womb is decisive"
4. Belgium.....	No ¹³	—	—
5. Bulgaria.....	No	No	— ¹⁴
6. Denmark	Yes	No	"Every child born with life, no matter at what stage of gestation the birth occurs, is registered as a <i>live-birth</i> . Every embryo expelled during or after the 29th week of gestation without signs of life, is registered as a <i>still-birth</i> . If the expulsion occurs before the 29th week, it is counted as an abortion and is not registered"
7. Finland	No	No	"A fully-developed child giving no sign of life at birth," as verified by the midwife
8. France	No	No ¹⁵	"A child born dead or dying before the declaration of birth"
9. German Empire—			
9a. Alsace-Lorraine	No	No	—
9b. Anhalt.....	No	No	"One showing no sign of life prior to complete separation from the mother"
9c. Bavaria	No	No	No
9d. Bremen	No	—	—
9e. Hamburg.....	No	No	— ¹⁶
9f. Hesse	No	No	— ¹⁷
9g. Lubeck	No	No	"Child of 6 or more months' gestation and 32 cm. length, born dead"
9h. Prussia	No	No	— ¹⁸
9j. Saxe Coburg-Gotha	No ¹⁹	No	—
9k. Saxe Meiningen	No	No	"Child of 6 or more months' gestation born dead or dying during birth"
9l. Saxony.....	—	—	— ²⁰
9m. Wurtemberg	No	No	— ²¹

* This question means decisions on subject of the definition of still-births for the purposes of registration.

¹³ Belgium.—"Il n'existe pas de définition légale du terme *mort-né*. Le décret du 4 juillet 1806 ne distingue pas entre les mort-nés proprement dits et les enfants ayant vécu mais morts avant la présentation à l'officier de l'état-civil. Il ne connaît que les *enfants présentés sans vie* et s'exprime comme suit :—

"1. Lorsque le cadavre d'un enfant dont la naissance n'a pas été enregistrée sera présenté à l'officier de l'état-civil, cet officier n'exprimera pas qu'un tel enfant est décédé, mais seulement qu'il a été présenté sans vie.

"Cet acte sera inscrit à sa date sur les registres des décès, sans qu'il en résulte aucun préjugé sur la question de savoir si l'enfant a eu vie ou non."

La statistique belge a trouvé dans ce décret la base de la statistique des enfants présentés sans vie et s'est attachée, dès 1848, à obtenir d'une part les renseignements intéressant les mort-nés proprement dits et, de l'autre part, les enfants présentés sans vie à l'officier de l'état-civil, mais ayant vécu 1, 2, ou 3 jours; mais ce n'est qu'en 1878 qu'elle arrêta définitivement les cadres. Dans une circulaire elle a déterminé ce qu'il fallait entendre par mort-né proprement dit et par autres enfants présentés sans vie :

(a) On entend par *enfant présenté sans vie* celui dont la naissance n'a pas été enregistrée et qui est présenté sans vie à l'officier de l'état-civil. (Décret du 4 juillet 1806.)

(b) On considère comme *mort-né*, l'enfant sorti sans vie du sein de la mère après la 180^e jour (sixième mois) de la gestation (argument de l'article 312 du code civil). Il suit de là que les fœtus de moins de six mois ne sont pas considérés comme mort-nés et ne doivent pas être portés sur les registres de l'état-civil.

Se basant sur ces instructions, la circulaire de 1878 a prescrit aux officiers de l'état-civil de s'enquérir chaque fois qu'un enfant leur est présenté sans vie, si l'enfant est sorti sans vie du sein de la mère, ou s'il a vécu, et dans ce dernier cas, du nombre de jours que l'enfant a vécu.

Le résultat de cette enquête *purement administrative* est consigné dans un registre distinct dont un extrait pour l'année est joint aux relevés annuels du mouvement de la population, pour être utilisé *dans un intérêt statistique*.

¹⁴ *Bulgaria*.—"La loi ni le règlement ne donnent pas de définition. C'est la Direction Générale de la Statistique qui en a donné dans ses circulaires. Est considéré pour *mort-né* chaque enfant qui vient au monde sans vie fusse-ce un seul moment—c'est à dire la Direction Générale de la Statistique a adopté la définition précise de la Science."

¹⁵ *France*.—"According to a decision of the Court of Besançon (October 31, 1844), it would appear that the registration of a still-birth is held by French jurisprudence to "include, not only children who have been the full term in the womb, but all such as are born sufficiently formed for it to be possible to declare the sex."

[See "Still-births in England or Other Countries," 1904, 279, p. 5.]

¹⁶ *Hamburg*.—"The regulations for midwives prescribe notice of still-birth to be given in all cases of children born after six or more months' gestation, who are dead at birth or die during birth. Abortions prior to the sixth month of gestation are not to be reported. In doubtful cases the medical man is left to decide whether the still-birth should or should not be reported.

¹⁷ *Hesse*.—"A still-born child is one born dead or dying during birth, after six months' gestation (or longer), the fœtus being not less than 30 cm. (*sic*) long.

¹⁸ *Prussia*.—"The following are defined as "still-born": (a) full-term children born dead; (b) fœtus born dead after 180 days' (six calendar months) gestation and 32 cm. long; and (c) fœtus closely approximating to (b).

¹⁹ *Saxe Coburg-Gotha*.—"The law distinguishes between (a) a child born dead and (b) one dying in birth.

²⁰ *Sarony*.—"The following "definition" is given of still-birth, but the authority for the same is not mentioned:—

"Still-born" applies to an embryo born dead after a gestation of six months or longer.

²¹ *Wurtemberg*.—"A child born dead after 28 weeks' gestation and 37 cm. in length.

TABLE D—Contd.

	1 Is there any definition of "still-birth" or "still-born" prescribed by law?	2 Has there been any judicial decision bearing upon the point?	3 What is the interpretation adopted for registration purposes?
10. Holland	No	—	—
11. Hungary	—	—	— ²²
12. Italy	No	No	— ²³
13. Luxemburg	No	No	See note 14, Table C
14. Norway	Yes	Yes	"Embryos born without signs of life after the commencement of the eighth month"
15. Roumania	No	—	— ²⁴
16. Spain	No	No	—
17. Sweden	Yes ²⁵	—	—
18. Switzerland	No ²⁶	No	Yes ²⁶
19. Japan.....	No	No	—
20. Egypt.....	— ²⁷	No	"A child not breathing at the time of birth"
21. <i>United States</i> —			
21a. California	Yes ²⁸	No	"A child dead at birth," i.e., not having lived separately
21b. Colorado	Yes ²⁹	—	—
21c. Columbia	No	No	"When the child has not breathed or shown other evidences of life after being altogether outside of the mother's body"
21d. Connecticut	No	No	"A child that has breathed at all, no matter for how short a time, is registered as a living birth"
21e. Indiana	Yes ³⁰	Yes	—
21f. Iowa.....	—	—	"Still-born is a child who does not breathe after birth" ³¹
21g. Kansas.....	No	No	"Dead at birth"
21h. Maine	No	No	"Still-births are those in which the child is dead when born, not includ- ing births which take place before the period of viability"
21j. Maryland	No	No	"Any signs of life would indicate a living birth"
21k. Massachusetts.....	Yes	—	"Born dead"
21l. Michigan	No	No	"If a child lived at all after complete separation it is considered as a living birth"
21m. Minnesota	No ³²	No	"Born dead"
21n. Missouri	— ³³	No	"Those dead at birth"
21o. Montana	Yes ³⁴	No	—
21p. Nebraska.....	No	No	"A child who has not breathed"
21q. New Hampshire.....	No	No	A viable child not born alive
21r. New Jersey	No	No	"A child that has breathed must not be returned as a still-birth"
21s. New Mexico	No	No	"Born dead"

* This question means decisions on subject of the definition of still-births for the purposes of registration.

- ²² *Hungary*.—A still-born child is one who is dead at the moment of separation from the body of the mother, death having taken place prior to or during the act of birth. If it can be definitely stated that gestation had lasted no more than seven months, the fetus is deemed to have aborted. Notification of abortions is not required. On the other hand, if a fetus, irrespective of the stage of its development, shows any signs of life after delivery, the case is deemed to be one of live birth, and the child has to be registered as both born alive and dying.
- ²³ *Italy*.—As regards registration there is no distinction between a still-born child and one born alive and dying before registration of birth. In both cases the entry is marked "dead." Only for statistical purposes is any distinction made between the two classes of events.
- ²⁴ *Roumania*.—The registration of still-births is not governed by law but by regulation. "Les mort-nés sont enregistrés sans aucune distinction des enfants nés viables qui ont décédé avant l'enregistrement de leur naissance."
- ²⁵ *Sweden*.—"A child is described as *living-born* if it breathes after birth, as *still-born* (dödfödd) if it manifests no signs of life after birth."
- ²⁶ *Switzerland*.—"Les instructions officielles disent textuellement. L'enfant *mort-né* est celui qui est mort avant ou pendant l'accouchement, tandis que l'enfant *né vivant* est celui qui a respiré après avoir été séparé du corps de sa mère."
- Les médecins "envoient la déclaration de décès à l'officier de l'état-civil et déterminent d'après leur observations ou les informations prises auprès des parents si l'enfant a respiré ou pas en venant au monde. C'est après ces données que l'enfant est enregistré comme *mort-né* ou *né-vivant*."
- ²⁷ *Egypt*.—(See note 30, Table C.)
- ²⁸ *California*.—"Law (relating to registration of death) specifically defines still-born children as those dead at birth and requires certificate of death and burial (or removal) permit in the usual form."
- ²⁹ *Colorado*.—"Still-born children or those dead at birth." (*Act of General Assembly*.)
- ³⁰ *Indiana*.—"When infant is born dead it is a still-birth, no matter what the period of gestation." There have been many decisions upholding the law.
- ³¹ *Iowa*.—"I believe that it is generally accepted that a child who breathes after birth and appears to have life by performing the physiological functions of breathing and heart beats has life, hence it is not still-born, and still-born when the reverse of the above exists."
- ³² *Minnesota*.—"The medical definition would undoubtedly be accepted by our courts. The term was defined in an old court case in New York State."
- ³³ *Missouri*.—"Still-born children or those dead at birth." (*Act of General Assembly*.)
- ³⁴ *Montana*.—"A child dead at birth is a still-born child."

TABLE D—*Contd.*

	1 Is there any definition of "still-birth" or "still-born" prescribed by law?	2 Has there been any judicial decision bearing upon the point?*	3 What is the interpretation adopted for registration purposes?
21. United States—Contd.			
21t. New York	No ³⁵	No	"A child born dead having never breathed and having attained suffi- cient development to determine sex"
21u. North Carolina	No	No	"If the child breathes at all it is not considered still-born"
21w. North Dakota	No	No	"Those dead at birth"
21x. Ohio	No ³⁶	No	Rule formulated by American Public Health Association
21y. Rhode Island (and Providence Planta- tion)	—	—	"Children born dead"
21z. Texas	No	No	"Dead at birth after 7 months' gesta- tion"
21aa. West Virginia	No	No	"The child which does not breathe"
21bb. Wisconsin	No	No	"No birth is considered a still-birth if the child is born alive"
22. Argentina	—	—	— ³⁷
23. Costa Rica.....	No	No	"Born dead"
24. Cuba	Yes ³⁸	Yes	—
25. Uruguay	No	No	"Born dead"

* This question means decisions on subject of the definition of still-births for the purposes of registration.

- ³⁵ *New York*.—Definition of still-birth “prescribed by State Department of Health, which is authorised by law to make such regulations as it deems necessary to bring about proper registration of vital statistics.”
- ³⁶ *Ohio*.—“Still-born children, or those dead at birth, shall be registered as births and also as deaths, and a certificate of both the birth and the death shall be filed with the local registrar . . .” Act of May 5, 1908. Sec. 6.
- ³⁷ *Argentina*.—The Registrar is not concerned with the question of live- or still-birth. His record is simply that the child was dead when the birth was registered. (*Cf.* Belgium.)
- ³⁸ *Cuba*.—A child born dead or dying within 24 hours of birth.

TABLE E.

	1	2	3	4
	In the compilation of statistics, are still-births entered among (a) births, (b) deaths, (c) both, or (d) separately?	Is the infantile mortality calculated upon births or upon estimated population (0-1)?	If upon births, are still-births included in any way?	What data are used for calculating birth- and death-rates?
1. <i>British Empire</i> —				
1a. England and Wales	— *	Births	—	Numbers registered
1b. Ireland	—	Births	—	Numbers registered
1c. Scotland	—	Births	—	Numbers registered
1d. Gibraltar	—	Births	—	Numbers registered
1e. Malta	(Statistics calculated by another office)			
1f. Ceylon	— ¹	Births	No	Numbers registered
1g. Cyprus	—	(Not calculated)		
1h. Hong-Kong	—	Births	No	Both numbers registered and those occurring
1j. India	(d)	Births	No	Numbers registered
1k. Straits Settlements	(d)	Births	No	Numbers registered
1l. Cape of Good Hope	(d) ²	Births	No	Numbers registered ³
1m. Gambia	(c)	(Not calculated)		
1n. Mauritius	(d)	Population	....	Numbers registered
1o. Natal	— ⁴	Births	No	Numbers registered
1p. Orange Free State	(d)	Births	No	Numbers registered
1q. Sierra Leone	—	Births	—	Numbers registered
1r. Transvaal	(d)	Births	No	Numbers occurring
1s. Alberta	(a) ⁵	Births	— ⁶	Numbers registered
1t. Bermuda	(c) and (d)	Births	No	Numbers registered
1u. British Guiana	(a)	Births	No	Numbers registered
1w. Jamaica	—	Births	—	Numbers registered
1x. Manitoba	(d)	Births	No	Numbers occurring
1y. New Brunswick	—	....	....	— ⁷
1z. Newfoundland	(c) and (d)	Births	Yes	Numbers registered
1aa. Nova Scotia	(d)	Births	No	Numbers registered
1bb. Ontario	(c) and (d)	Births	Yes	Numbers occurring
1cc. New South Wales	—	Births	—	Numbers registered
1dd. New Zealand	—	Births	No	Numbers registered
1ee. Queensland	—	Births	—	Numbers registered
1ff. South Australia	—	Births	—	Numbers registered
1gg. Tasmania	—	Both	—	Numbers registered
1hh. Victoria	(d) ⁸	Births	No	Numbers registered
1jj. Western Australia	(d)	Births	No	Numbers registered
2. Austria	(a) and (d)	Births	No	Numbers registered
3. Bosnia and Herzegovina	(d)	Births	No	Numbers registered
4. Belgium	(b)	— ⁹	....	—
5. Bulgaria	(a) and (d)	Both	....	Numbers occurring
6. Denmark	(d)	Births	No	Numbers occurring
7. Finland	(d)	Births	No	Numbers registered
8. France	(a) ¹⁰	Births	No	Numbers registered ¹¹
9. <i>German Empire</i> —				
9a. Alsace-Lorraine	(d)	Births	No	Numbers occurring
9b. Anhalt	(c) and (d)	Population	....	Numbers registered
9c. Bavaria	(c) and (d)	Births	No	Numbers registered
9d. Bremen	(c)	Both	No	Numbers occurring
9e. Hamburg	(b) and (d)	Births	No	Numbers occurring
9f. Hesse	(d)	Births	No	Numbers occurring
9g. Lubeck	(c) and (d)	Births	....	Numbers occurring

* — means that still-births, not being recognised for registration purposes, do not enter into statistics.

.... means question not answered.

NOTES.

- ¹ *Ceylon*.—Still-births are not included either among the births or deaths, nor shown in any reports on vital statistics.
- ² *Cape of Good Hope*.—Registration very lax, “many persons neglecting to register still-births, affecting to consider them merely as miscarriages or abortions.”
- ³ *Cape of Good Hope*.—Prior to 1905 the numbers occurring were used.
- ⁴ *Natal*.—Still-births are not shown in published vital statistics.
- ⁵ *Alberta*.—The percentage of still-births so included is always stated.
- ⁶ *Alberta*.—This question is not answered, but judging from other answers (see note 5 *supra*) still-births are included.
- ⁷ *New Brunswick*.—“The returns are so incomplete that no statistics have been compiled from them, as they would be very misleading.”
- ⁸ *Victoria*.—Although the registration of still-births is not compulsory, returns are issued of the numbers of still-births reported to the registrars.
- ⁹ *Belgium*.—Only the numbers recorded are included in the annual returns, no rates being calculated. Still-births are not included in the totals of live births or of deaths. Such totals give the numbers of births, &c., entered on the registers.
- ¹⁰ *France*.—The published numbers include a proportion of children “presented dead” (*dits mort-nés*).
- ¹¹ *France*.—Infantile mortality rates are calculated on two bases:—(*a*) the deaths of one year to the registered live-births of that year, and (*b*) the deaths of one year to the mean number of live-births registered in two successive years. “Les deux rapports sont d’ailleurs très peu différents.”

TABLE E—Contd.

	1	2	3	4
	In the compilation of statistics, are still-births entered among (a) births, (b) deaths, (c) both, or (d) separately?	Is the infantile mortality calculated upon births or upon population (b-1)?	If upon births, are still-births included in any way?	What data are used for calculating birth- and death-rates?
9. <i>German Empire</i> —Contd.				
9h. Prussia	(c)	Births	No	Numbers occurring
9j. Saxe Coburg-Gotha	(b) and (d)	Births	No	Numbers registered
9k. Saxe Meiningen	(a)	Population	No	Numbers registered
9l. Saxony	(a) ¹²	Births ¹³	No	Numbers registered
9m. Wurtemberg	(d)	Births	No	....
10. Holland	(d)	Births	No	Numbers occurring
11. Hungary	*— ¹⁴	Births	No ¹⁵	Births occurring
12. Italy	(d)	Births ¹⁶	No	Numbers registered
13. Luxemburg	(c) and (d)	Births	No	Numbers occurring
14. Norway	(d)	Births	No	Numbers registered ¹⁷
15. Roumania	(d)	Births ¹⁸	No	....
16. Spain	(d)	Population	No	Numbers registered
17. Sweden	(a)	Births	No	Numbers registered
18. Switzerland	(d)	Births	No	Numbers registered
19. Japan	(d)	(Not calculated)		Numbers registered
20. Egypt	(d)	Births	No	Numbers registered
21. <i>United States</i> —				
21a. California	— ¹⁹	(Not calculated)		....²⁰
21b. Colorado .....	...	....	....	....
21c. Columbia	(d)	Births	No	Numbers registered
21d. Connecticut	(d)	Births	No	Numbers registered
21e. Indiana	(c) and (d)	Population	—	Numbers registered
21f. Iowa	—	Population	....²¹	....²²
21g. Kansas	(d)	....	....	....
21h. Maine	(d)	Births	....	Numbers registered
21j. Maryland	(d)	Population ²³	No	....
21k. Massachusetts	(d)	Births	No	Numbers registered
21l. Michigan	(d)	Population	No	Numbers registered
21m. Minnesota	(d)	Population	....	Numbers registered
21n. Missouri	(d)	Births	No	Numbers registered
21o. Montana	(d)	Births	No	Numbers registered
21p. Nebraska	(d)	Population	....	Numbers registered
21q. New Hampshire	(d) {	Births and population }	No	Numbers registered
21r. New Jersey	(d)	Population	....	Numbers registered
21s. New Mexico	—	(Not calculated)		....
21t. New York	(d)	Births	No	Numbers occurring
21u. North Carolina	(d)	(Not calculated)		....
21w. North Dakota	(c) and (d)	Both	Yes	Numbers registered
21x. Ohio	(d)	Population	No	Numbers registered
21y. Rhode Island (and Providence Plantation)	(d)	Births	No	Numbers registered
21z. Texas	(c) and (d)	Births ²⁴	Yes	Numbers registered
21aa. West Virginia	(c)	Births	....	Numbers registered
21bb. Wisconsin	(a)	Births	No	Numbers occurring
22. Argentina	(d)	Births	No	Numbers registered
23. Costa Rica	(c)	....	....	Numbers registered
24. Cuba	(d)	Population	....	Numbers registered
25. Uruguay	(b)	Population	....	Numbers registered

* — means that still-births, not being recognised for registration purposes, do not enter in statistics.

.... means question not answered.

- ¹² *Saxony*.—Still-births are registered as deaths, are (for statistical purposes) included among births, but entirely excluded in calculations of infantile mortality.
- ¹³ *Saxony*.—Infantile mortality calculated both upon births registered and upon the births actually occurring during the period under review.
- ¹⁴ *Hungary*.—In compilation of vital statistics the still-births are "entirely ignored in taking out the numbers of births *and* deaths."
- ¹⁵ *Hungary*.—A special rate is calculated at each census based on the numbers of deaths during the census year, and one year before and after, and the number of children enumerated at ages under 1 year.
- ¹⁶ *Italy*.—Infantile mortality rate is calculated on the mean (*semisomma*) of the live-births registered in two consecutive years.
- ¹⁷ *Norway*.—The actual numbers occurring are also given in the reports for the whole country, but not for the subdivisions thereof, save as regards deaths.
- ¹⁸ *Roumania*.—Using the mean (*semisomme*) of live-births.
- ¹⁹ *California*.—Still-births are excluded from tabulation of births and deaths, and are not published separately.
- ²⁰ *California*.—"Deaths relate specifically to number occurring (during period under review). Difficulty of securing prompt birth registration has necessitated, so far, compilation of births by numbers registered."
- ²¹ *Iowa*.—There is no registration of births, the only rate of infantile mortality is that based upon estimated population aged 0—1 year.
- ²² *Iowa*.—The answer is ambiguous, but apparently the numbers (of deaths) registered are used.
- ²³ *Maryland*.—Birth records too unreliable.
- ²⁴ *Texas*.—"Figures have thus far been so incomplete that intelligent analyses are impossible."

APPENDIX.

FORM OF INQUIRY.

Royal Statistical Society.

Country or State.....

- | | |
|--|---|
| <p>*(A) 1. Is the registration of births compulsory?</p> <p>(B) If so, what is the penalty for omission to register?</p> <p>(A) 2. How soon after a child is born must the birth be registered?</p> <p>(A) 3. Is the registration of deaths compulsory?</p> <p>(B) If so, what is the penalty for omission to register?</p> <p>(A) 4. How soon after death must registration be effected?</p> <p>(B) 5. Do many births or deaths escape registration?</p> <p>(C) 6. If a child be born alive but die before the registration of the birth, is the birth entered as "living-born" or as "still-born"?</p> <p>(C) 7. Is the registration of still-births compulsory? If so, what is the penalty for omission to register?</p> <p>(B) 8. Is it possible to effect burial without production of proof of registration whether of death or still-birth? If so, are there any other means of securing the registration of deaths or still-births?</p> <p>(D) 9. Is there any definition of "still-births" or "still-born" prescribed by law?</p> <p>(D) 10. Has there been any judicial decision bearing upon the point?</p> | <p>(D) 11. What is the interpretation of "still-birth" ("still-born") adopted for registration purposes?</p> <p>(C) 12. Are still-births registered as (a) births, (b) deaths, (c) both, or (d) in a separate register?</p> <p>(E) 13. In compiling your Vital Statistics, do you include still-births among (a) births, (b) deaths, (c) both, or (d) are they tabulated separately?</p> <p>(E) 14. Is the mortality among infants under one year of age calculated upon births or upon estimated population at that age?</p> <p style="padding-left: 2em;">If upon births are still-births included as births and deaths or in any other manner? Upon the births of what period is the rate calculated?</p> <p>(E) 15. In compiling statistics of births, still-births and deaths for any period, do the births, &c., relate to the numbers occurring, or to the numbers registered during that period?</p> <p>(A) 16. Dates when registration of (a) births, (b) still-births and (c) deaths came into force.</p> |
|--|---|

* NOTE.—The initial letter indicates the table in which the replies are summarised.

List of countries and States from which full replies have been received :—

**1. British Empire—*

- 1a. England and Wales.
- 1b. Ireland.
- 1c. Scotland.
- 1d. Gibraltar.
- 1e. Malta.
- 1f. Ceylon.
- 1g. Cyprus.
- 1h. Hong-Kong.
- 1j. India.
- 1k. Straits Settlements.
- 1l. Cape of Good Hope.
- 1m. Gambia.
- 1n. Mauritius.
- 1o. Natal.
- 1p. Orange Free State.
- 1q. Sierra Leone.
- 1r. Transvaal.
- 1s. Alberta.
- 1t. Bermuda.
- 1u. British Guiana.
- 1w. Jamaica.
- 1x. Manitoba.
- 1y. New Brunswick.
- 1z. Newfoundland.
- 1aa. Nova Scotia.
- 1bb. Ontario.
- 1cc. New South Wales.
- 1dd. New Zealand.
- 1ee. Queensland.
- 1ff. South Australia.
- 1gg. Tasmania.
- 1hh. Victoria.
- 1jj. Western Australia.
- 2. Austria.
- 3. Bosnia and Herzegovina.
- 4. Belgium.
- 5. Bulgaria.
- 6. Denmark.
- 7. Finland.
- 8. France.

9. German Empire—

- 9a. Alsace-Lorraine.
- 9b. Anhalt.
- 9c. Bavaria.
- 9d. Bremen.
- 9e. Hamburg.
- 9f. Hesse.
- 9g. Lubeck.
- 9h. Prussia.
- 9j. Saxe Coburg-Gotha.
- 9k. Saxe Meiningen.
- 9l. Saxony.
- 9m. Wurtemberg.
- 10. Holland.
- 11. Hungary.
- 12. Italy.
- 13. Luxemburg.
- 14. Norway.
- 15. Roumania.
- 16. Spain.
- 17. Sweden.
- 18. Switzerland.
- 19. Japan.
- 20. Egypt.
- 21. *United States—*
 - 21a. California.
 - 21b. Colorado.
 - 21c. Columbia.
 - 21d. Connecticut.
 - 21e. Indiana.
 - 21f. Iowa.
 - 21g. Kansas.
 - 21h. Maine.
 - 21j. Maryland.
 - 21k. Massachusetts.
 - 21l. Michigan.
 - 21m. Minnesota.
 - 21n. Missouri.
 - 21o. Montana.
 - 21p. Nebraska.
 - 21q. New Hampshire.
 - 21r. New Jersey.
 - 21s. New Mexico.
 - 21t. New York.
 - 21u. North Carolina.
 - 21w. North Dakota.
 - 21x. Ohio.
 - 21y. Rhode Island (and Providence Plantation).
 - 21z. Texas.
 - 21aa. West Virginia.
 - 21bb. Wisconsin.
- 22. Argentina.
- 23. Costa Rica.
- 24. Cuba.
- 25. Uruguay.

*NOTE.—The initial figures and letters indicate the positions in Tables A and E.

Replies have been received from the following, but the answers are not included in Tables A—E:—

Saskatchewan.—*

The registration of births and deaths is compulsory, under penalties ranging from \$1-50.

Registration of a birth must be effected within one month, and as the Law requires the registration of birth of "any child born," registration of still-births is required.

No time is prescribed for the registration of the *act* of death, but by Law the issue of a burial permit should precede disposal of the corpse. Funerals do take place without such permit being issued, and in that event the person conducting the funeral is required (under penalty of \$1-50) to give information to the registrar within one month. The medical practitioner last attending the deceased is required to forward a certificate of the *cause* of death to the registrar within a month of the occurrence of death.

Registration initiated under Law of 1897.

Illinois, U.S.A.—*

The registration of births and deaths is compulsory, under penalties ranging from \$10-100, or imprisonment up to 30 days. In each case the time allowed for registration is 30 days, but burial permits are required in most cities and townships of 1,000 inhabitants and over, and the period for registration of a death is shorter than 10 days in such places.

Registration was initiated under Law of 1903.

Mississippi, U.S.A.—

There is no registration of births or deaths.

Nevada, U.S.A.—*

The registration of births and deaths is compulsory, under penalties ranging from \$5-50.

Registration of a birth must be effected within 10 days of birth, but the period can be shortened by municipal regulation. Registration of a death must precede burial or other disposal of a body, as a burial permit is necessary before the funeral can take place, the penalty for holding the funeral without the permit being \$20-100. The permit is granted only after registration.

Registration applies to still-births, as the Law is quite general.

Registration was initiated under Law of February, 1911.

Oregon, U.S.A.—

The registration of births and deaths is compulsory, under penalties ranging from \$10-100.

Registration of a birth must be effected before the last day of the month in which the birth takes place. Registration of a death is to be effected within such time as the local municipality may direct.

Registration was initiated by the Law of 1905.

* The Inquiry Form was not filled up, but the Law dealing with registration was forwarded.

Virginia, U.S.A.—

There is no State Law requiring registration of births and deaths, but such registration is required, under municipal regulations, in the larger cities and towns.

Paraguay.—

Proposals for setting up registration are under consideration.

German Empire.—

(The following replies received from the Imperial Statistical Bureau exhibit considerable divergencies from those received from the constituent States of the Empire, although the Imperial law is stated to be of universal application.)

1. Registration of births compulsory. Penalty for neglect, a fine not exceeding 150 marks, or imprisonment.
2. A live birth must be registered within a week, and a still-birth not later than the next week day following the birth.
3. As No. 1.
4. A death must be registered on the week day next following the day of death.
5. No. Quite an exceptional occurrence.
6. As a living born child.
7. As No. 1.
8. No.
9. None given by Imperial law. The point is usually settled by the regulations issued to midwives by the constituent States.
10. No.
11. —
12. As deaths.
13. They are tabulated separately.
14. Upon the births of children born alive only, using the numbers of births registered.
15. To the numbers registered.
16. Registration managed by the State since January 1st, 1876, previous to that date by the ecclesiastical authorities.

Dominion of Canada.—

The registration of births and deaths is a matter for the provincial governments.

United States of America.—

Abstract of covering letter.—(The registration of vital statistics is entirely in the hands of the State authorities, or, in the absence of a general or effective State law, of the municipal authorities. In the district of Columbia (City of Washington) alone is registration governed by federal law. Since the permanent foundation of the Census Bureau, that office has endeavoured to promote registration and to secure uniformity of procedure. A "model bill" has been drafted by that office in consultation with the State authorities, the American Public Health Association and others. The adoption of the model has been urged on the non-registering States. The "registration area," as regards deaths, included just over 56 per

cent. of the total population of continental States. The registration of births is still in a very unsatisfactory position. No attempt to collect statistics of births for publication by the Census Bureau was possible before 1908, and that report was very incomplete. It did not deal with still-births at all, but it is intended to include figures thereof in subsequent reports (*i.e.*, from 1909, onwards). There is, however, such divergence in the rules relating to still-births in the different States, and a great want of uniformity as to the earliest limit (duration of gestation) at which registration should be demanded. In the most recent legislation (that for Columbia), registration is not required when the foetus "has apparently not passed the fifth month of interogestation").

(The following are the full replies to the questions in the Inquiry Form forwarded by the Census Office as "giving the information, as far as practicable, for the country as a whole.")

United States.

[1.] Intended to be compulsory under many State laws and municipal ordinances, which, however, are seldom enforced thoroughly by prosecution in cases of violation. The penalties differ widely among the various States. The "model law" provides for a fine of not less than five dollars, nor more than fifty dollars.

[2.] The interval varies in different States, but perhaps the most common is that recommended by the model law, *viz.*, ten days.

[3.] Intended to be compulsory under many State laws and municipal ordinances, and enforced with at least a fair degree of thoroughness in the States and cities accepted by the Bureau of the Census as constituting the "registration area" for deaths (*see* Annual Reports on Mortality Statistics). The penalties differ in the various States; that of the model law is a fine of not less than twenty or more than one hundred dollars. Usually the alternative of imprisonment is included.

[4.] The model law and the laws of all States that possess fairly effective registration of deaths require the death to be recorded before interment, other disposition, or removal of the body. The model law also requires registration, when temporarily held pending further disposition, within 72 hours after death.

[5.] Many deaths, and more births, entirely escape registration in the United States. Perhaps, for the country as a whole, about one-half of the births that occur are registered, and about two-thirds of the deaths. Some States have no laws on the subject, or laws that are so ineffectively enforced that the results are very incomplete. No State has so far secured complete registration of all births, but in a few the registration is approximately complete. For the "registration area" for deaths, which included, for 1909, 56.1 per cent. of the population of continental United States, probably over 90 per cent. of all deaths were recorded, and in many States and cities the registration of deaths, under compulsory burial permits, is practically complete.

[6.] The accepted practice in the United States is to enter such a child as "living-born."

[7.] Compulsory to the extent that birth and death registration laws are enforced. Under the model law (Sec. 6), and in many State laws, double registration of still-births, both as births and deaths, is provided, with double compensation to the local registrar, for the express purpose of securing more complete returns.

[8.] This may be done in all States that do not require burial permits or that fail to enforce such requirement. There are no other means of securing the registration of deaths or still-births, except that in a few instances enumerations of births (*e.g.*, Iowa, Tennessee), are made by which some still-births would be obtained.

[9.] There is no definition of "still-births" or "still-born" prescribed by the statute laws of the States, but rules or regulations having the effect of law have in some instances been adopted by the State sanitary authorities. For example, the following resolutions adopted by the State Board of Health of Illinois, under date of October 18, 1910, may be quoted:—

Reports of births.

"*Resolved*, That under the authority conferred upon the State Board of Health in the Act requiring reports of births and deaths, and the recording of the same, approved May 6, 1903, it is hereby directed that reports of births made in accordance with the provisions of this Act, by physicians, midwives, parents, or householders, shall, in the case of the birth of a child (*such birth to be a complete removal of the child from the maternal parts, whether or not there be a detachment of the placenta or severance of the umbilical cord*) that has shown any evidence of life, *e.g.*, breathing, crying, beating of the heart, or muscular movements, contain the following information in the order stated."

Reports of still-births.

"*Resolved*, That under the authority conferred upon the State Board of Health in the Act requiring reports of births and deaths, and the recording of the same, approved May 6, 1903, it is hereby directed that reports of births made in accordance with the provisions of this Act, by physicians, midwives, parents, or householders, shall, in the case of the birth of a child (*such birth to be a complete removal of the child from the maternal parts, whether or not there be a detachment of the placenta or severance of the umbilical cord*) that has not shown any evidence of life (*still-birth*), *e.g.*, breathing, crying, beating of the heart, or muscular movements, contain the following information in the order stated."

It is directed by the Board that "When issuing birth and still-birth certificates, county clerks shall have the above resolutions printed on the reverse of the certificates. The italicized portions appearing above being revisions of the words 'that has breathed' (birth), and 'that has not breathed' (still-birth), formerly appearing on birth and still-birth certificates respectively."

[10.] A complete analysis of judicial decisions has not been made, and, so far as known, no decisions have occurred in registration practice. The judicial decisions are, to some extent, in conflict, and the definitions of still-births or still-born laid down by them in civil actions are broader than in criminal actions, owing, probably, to the

difference in the rules of evidence between the two classes of cases. Some examples are the following:—

(a) *Criminal cases*.—A child is born alive, when breathing and living by reason of breathing through its own lungs alone, it exists as a live child without deriving any of its living or power of living by or through any connection with its mother. [This decision also stated the two propositions—(1) that while it has been held both ways, the better doctrine is that the umbilical cord must be severed, and (2) that respiration is not an infallible test of live birth.] *State v. Winthrop*, 43 Iowa, 519.

Actual birth means a complete expulsion of the child from the body of the mother alive. *Wallace v. State*, 10 Texas, App. 255, 270.

(b) *Civil cases*.—A stillborn child is one born dead or in such an early stage of pregnancy as to be incapable of living, though not actually dead at time of birth. Children born within the first six months after conception are considered by the civil law as incapable of living. *Marsellis v. Thalhimer*, 2 Paige (N.Y.), 35, 41.

It is now settled, both in England and in this country, that from the time of conception the infant is in esse for the purpose of taking any estate, provided, however, that the infant be born alive, and after such a period of foetal existence that its continuance in life might be reasonably expected. *Harper v. Archer*, 4 Smed. and M., Mississippi, 108.

A distinct effort to breathe, made by the issue after birth, and while the umbilical cord is yet uncut is proof that the issue was born alive. *Goff v. Anderson*, 91 Kentucky, 303; 15 S.W., '866.

An infant is in esse for the purpose of taking an estate for its benefit from the time of its conception, provided it be born alive, and after such a period of foetal existence that its continuance in life may be reasonably expected. *Nelson v. Iverson*, 24 Alabama, 9.

[11.] The present accepted American interpretation is that indicated by the Rules of Statistical Practice (*see* Census Bulletin 108, Mortality Statistics, 1909, pp. 37–39, especially Nos. 4 to 10 and 16 to 23), which endeavor to draw a sharp line of demarcation—the moment of “birth”—so that all children that survive that moment shall be counted as living births, and their deaths, even if they survive but an instant the moment of birth, shall be registered as deaths. No lower limit of uterogestation has been generally adopted, although in some States still-births under seven months, and in the district of Columbia, under five months, need not be recorded.

[12.] Still-births are registered both as births and deaths under the model law and in the majority of States (*e.g.*, Massachusetts, Michigan, Missouri, Ohio, Pennsylvania); sometimes as deaths only (*e.g.* California, Rhode Island); as births only (Oklahoma); neither as births nor deaths but on separate certificates provided for still-births (*e.g.*, Connecticut, District of Columbia, New York). Some States have no specific provisions relating to still-births in their registration laws, but nevertheless record them either as births or deaths, or both as births and deaths, or separately.

[13.] No matter how still-births are registered, they are now compiled, both by the Bureau of the Census and practically all State and city registration offices, neither as births nor deaths, but separately as still-births. If registered as births or deaths they should be sorted out in compilation, and if derived from the returns of both births and deaths, the number should be determined by comparison of the two sets of returns. Up to and including 1890 the Census compiled still-births as births and as deaths, and some States and cities followed this practice even later.

[14.] Infantile mortality is computed, preferably, upon the deaths of infants under one year of age (exclusive of still-births) and the births registered for the same year (also exclusive of still-births). But the almost entire absence of complete birth registration in the United States has rendered it impossible to present satisfactory figures of infant mortality. The "births" in the decennial volumes of the Census on Mortality Statistics have been, not registered births, but the enumerated population under one year at the date of the Census (June 1) *plus* infants born and dying in the Census year in registration areas.

[15.] All vital statistics compiled by the Census and by the great majority of the States relate to the number of events occurring, not to the number merely registered, during the year. In a few States, and perhaps in more cities, in which the annual statistics are formed of consolidations of monthly or weekly compilations, the numbers are those registered.

[16.] No definite dates can be given for the beginning of the registration of still-births, because these were usually registered in connection with births and deaths. The registration of births and deaths, and frequently of marriages, was usually provided for under the same law. The first law of the modern type, not to return to Colonial provisions, was that of Massachusetts (1842) and laws have been enacted in the various States (many of them, unfortunately, ineffective) from that year until the present (1911). Bills on this subject will be presented at the next sessions of the State Legislature in several States.

Copies of the Registration Laws have been received from :—

- Alberta, 1907, as amended in 1908.
- Argentina, 1905.
- Bermuda, 1899, 1909.
- California (excerpts “Law for the Registration of Vital Statistics”).
- Cape Colony, 1894 (also “Births and Deaths : Regulations and Instructions”).
- Ceylon, 1895.
- Colorado, 1907.
- New Jersey (Births and Deaths), 1909 ; (Marriages), undated.
- New York, 1909 ; also forms of certificates.
- New Zealand, 1908.
- Illinois—“Public Health Laws and Sanitary Memoranda,” 1907.
- Nevada, 1911.
- Nova Scotia, 1909.
- Ohio, 1908.
- Ontario, 1908.
- Rhode Island, 1911.
- Saskatchewan, 1897.
- Switzerland, 1874 ; also “Guide for Registration Officers” and specimen forms.
- Tasmania—“Instructions Relative to the Registration of Births and Deaths,” 1903.
- Texas—“Sanitary Code,” 1911.
- Western Australia, 1905, 1908.
- United States of America (Bureau of the Census), “Model Law,” &c.

Annual Reports have been received from :—

- Bermuda, 1908, 1909.
 - California, 1908-10.
 - New Hampshire, 1908, 1909.
 - Nova Scotia, 1909-10.
 - Newfoundland, 1910.
 - Switzerland, 1908 ; also “Mariages, Naissances et Décès en Suisse, 1871-90” (pt. ii—Births ; pt. iii—Deaths).
 - United States of America (Bureau of the Census), Mortality Statistics, 1909.
-

BIBLIOGRAPHY.

- Still-birth Interments. *Return to House of Commons* (July, 1891). No. 321.
- Still-births in England and other Countries. *Return to House of Commons* (June, 1893). No. 279.
- Beitrag zu einer einheitlichen Aufarbeitung der Geburtsstatistiks, Korösy. *Bulletin Internat. Instit. Statis.* xii, p. 294. (Tables of comparability of statistics of births, &c.)
- La Statistique Internationale du Mouvement de la Population*, L. March, 1905.
- Dictionnaire Encyclopédique des Sciences Médicales—Arts. Mort-né, Décès, &c.* (Bertillon père).
- Annual Reports of the Registrar-General of England and Wales.*—"Arrangements respecting the Registration of Births, Deaths, and Marriages in the British Colonies and Possessions." 30th Report (1867), p. lxvi. 65th Report (1902), Appendix.
- Life, Birth, and Live-Birth. *Law Quarterly Review*, April, 1904.
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ADDRESS TO THE ECONOMIC SCIENCE AND STATISTICAL SECTION
OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF
SCIENCE, 1912.¹ By Sir HENRY H. CUNYNGHAME, K.C.B.,
President of the Section.

ALTHOUGH the theories of Auguste Comte as to the progress of the sciences are, in many respects, open to question, yet he made two contributions of especial value to our ideas on that subject. In the first place, he was one of the earliest writers who maintained that the social and political sciences are subject to laws just as exact, though more complicated, as the laws which govern the physical sciences; and, in the next place, he formulated the celebrated principle of the three phases of thought. According to this view all sciences commence with a theological stage, they pass through a metaphysical stage, and end by becoming positive.

In a primitive state of civilization man attributes all phenomena to the exercise of volition; in a more advanced stage of thought he endeavours to attribute them to "virtues" or "agencies." The third stage is reached when he ceases to speculate, and uses general principles rather as modes of classifying phenomena than of explaining them. An example may be taken from theories regarding the nature of fire. At first, fire, both celestial and terrestrial, wherever it occurred, was believed to be due to the direct action of a god. Under Aristotle and the Greeks the phenomena of heat, burning, and dryness were attributed to a principle, one of the characteristics of which was a tendency to fly up to the circle of the stars. But in modern times, owing to the labours of the chemists and physicists, it has been explained as a violent motion of molecules. Of its ultimate character we are still ignorant; but the study of heat has passed into a positive stage, in which great progress has been made in classifying its properties and extending our knowledge of them.

The history of ontology is an example of a study which for centuries was in the theological stage, but which emerged from that condition and entered the metaphysical stage chiefly through the labours of the schoolmen. From their time onwards it steadily evolved along the lines laid down by the realists on the one hand and the conceptualists on the other, until an attempt at a union of their systems was made by Hegel. But even Hegelism is only metaphysical. We know nothing of what he means by his absolute, which might be the god of Averrhoes or Spinoza on the one hand, or the matter of La Mettrie on the other. The philosophy of the absolute is mere metaphysics.

Positive philosophy or science is at best a classification of phenomena; of ultimate causes we can know nothing. Our knowledge, as is finely said by Byron, is but an exchange of ignorance

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for that which is another kind of ignorance, though immense progress in knowledge of phenomena is made by the transaction.

One of the signs that a science has passed into the positive stage is that it has been subjected to the laws of mathematics. Mechanics, physics, chemistry, and electricity have long since been treated mathematically. Biology has only recently begun to receive mathematical treatment. Politics, economic sciences, sociology, anthropology, and language have, however, hitherto firmly resisted attempts to bring them under mathematical guidance. In some cases attempts have been made—as, for example, when that great mathematician, Professor Sylvester, endeavoured to formulate a mathematical poetry. Unfortunately he put his theories into practice, but the mathematical poems which he composed were not such as to encourage the adoption of his methods. The above sciences have, indeed, passed out of the theological stage. We no longer ascribe political maxims to the direct commands of God, nor social phenomena to direct Divine interposition. But all the social sciences are for the most part still in the metaphysical stage. The doctrine of the divine right of kings has only disappeared in order to be replaced by the doctrine of the divine right of majorities. Yet, from a positive point of view, neither of these stands on a footing much firmer than that of the other. The “duty of obedience to authority” and the “right of resistance” are in the same condition. The “right to work,” the “right to live,” “the right to a living wage,” “the right to the vote” are all metaphysical propositions assumed as axiomatic by various energetic writers and speakers, and which are usually advanced with a dogmatism proportioned to the uncertainty of their foundation. Yet, on what basis do they rest? One might with equal cogency declare for “the right of the stronger to destroy the weaker,” “the duty to improve the race by permitting and encouraging the forcible elimination of the unfit.” Or, again, we might argue that animals have a right to be protected against attempts made upon their life or property, and to be considered in any scheme for the promotion of the greatest happiness of the greatest number. This problem is said to have perplexed Bentham in his later years. For, by a negation of the doctrine of the immortality of the soul, it was difficult for him to see why they were not to be put on a par with man. Or, again, take Proudhon’s aphorism: “Everyone has a right to that which he has made. Who made the land?—God. Then, proprietor, begone.” Even if the major premiss were granted, it is easy to see that the proprietor might logically refuse to give up the land till God came Himself to ask for it, and decline to surrender it to one who had no more share in making it than the person actually in possession. Another example is the metaphysical aphorism that every right involves a corresponding duty; so that, if I have a right to do a thing, it is the duty of others concerned in the action to let me do it. This axiom seems at first sight to have a certain amount of plausibility. But does it follow, from the fact that I have a right to kill my ducks, that it is their duty to come and be killed? Nor in this case does the reason addressed to the ducks by the girl in

the nursery rhyme appear likely to be very convincing to them. Thus also the right to individual property, the right to an equality of enjoyment, the right to an equality of opportunity, the right of an individual to be considered as an end in himself, the duty of an individual to be considered only as part of an organised society, are all metaphysical assumptions having no firm positive basis. Equally baseless is the axiom that wherever the State enjoins a duty, as on a parent to educate his children, the State ought to pay for it; or that a local authority contributing funds to an object has a right in every case to interfere with their administration. Yet these are mere chance specimens of the political dogmas that have for years been flying about, and which emphasize the undoubted fact that politics and social science have not yet entered the positive stage of thought.

In what stage is political economy? It appears still the battleground of opposite schools. Some there are who tell us that it has "gone to Saturn." But this only raises the question: What is meant by going to Saturn? Is it meant that the so-called laws of economics are not laws at all, and that the whole pretended science is built on false foundations? Or is it meant that those engaged in the practical politics of the country have resolved to legislate in defiance of the laws of economics, and to settle the problems of Free Trade and Protection, the taxation of fixed and movable property, and the regulation of wages, as though these problems were not subjected to any natural laws at all?

The latter position would, of course, be particularly dangerous if it turned out that there were laws, and that those laws were being ignored. For example, there is a school of biologists who contend that acquired characteristics are never inherited, and that therefore all education and improvement of environment can only be useful inasmuch as they promote the generation of the best types—but that, unscientifically used, these and other means of improvement may, by promoting the survival of the most unfit, only damage humanity. The truth or falsehood of this statement is no concern of this Section of the Association; only one may be permitted the remark that, if it is really a law applicable to the human race, and if it is ignored, it seems most probable that the law will remain here on earth, and that it is not the law, but the race that ignores it, which will go to Saturn. Or, to take an example more directly connected with political economy, it is alleged by the students of that science that there are certain laws which regulate wages. They are not altogether in agreement upon the laws, still less upon the mode of expressing them, or upon the modifications which are necessary to make them true. This is only natural in a science that is only just entering upon a positive stage. But I suppose most economists would agree that (provided suitable meanings are given to the words) "Wages in a free market depend upon the demand and supply of labour."

A Legislature, wishing to remedy social inequalities and evils, might resolve to render the market no longer free—to impose a minimum wage, or put a tax upon wages, or in other ways to

regulate them by statute. And legislation might go so far as to render wages wholly dependent on scales fixed by authority or by custom. Or, again, a powerful combination, either of employers or of workmen, might unite to fix rates of wages and render it impossible in practice for any other rates to be paid. Systems established by these means might be wise or foolish, beneficial or injurious. But could it be said that the authors of them had succeeded in sending political economy to Saturn? Certainly not. They might have rendered inapplicable that chapter of political economy which deals with price as fixed by exchange in a free market, but only to bring the case under the next chapter, entitled "Price as fixed under conditions of monopoly." The political economy would be there surely enough, with its laws, and with their consequences for those who ignore its teachings.

I am not, mind, arguing against such attempts. Man is a social animal, not merely an individual unit, and it may be wise and desirable that certain of his dealings should be regulated by conditions depending on legal regulations rather than on the free play of demand and supply. I only point out that if political action be taken in the field of economics such action will, whether the authors of it wish it or not, be governed by the laws of economics, and those who purpose such action must consider what effect it will have on the flow and investment of capital, the demand for commodities, and, in fact, duly take into account the whole problem. For, if they do not, it is not the laws of supply and demand that will go to Saturn. Again, before settling a scheme of taxation we ought to study the cases in which a tax levied on one class falls on another, as, for instance, a tax intended to be paid by landlords, which really falls upon their tenants; of taxes levied on tenants which fall on their landlords; of taxes levied on producers that can be shown ultimately to fall on consumers, and of taxes levied upon commodities that can be shown to fall on the workmen by whom they are produced. For a tax often resembles an arrow shot into the air; though apparently aimed in a definite direction it may fall one knows not where, obedient to the laws of the incidence of taxation, just as an arrow in its flight is subject to the inflexible laws of air resistance, friction, and gravity. Or, again, when we prohibit work of children or young persons, to whom such work is detrimental, we must consider not only one side of the question; but we must also take into account the loss that may ensue in wages, and the consequences to the nutrition of the family and also indirectly to the growth of population.

In fact, in all these and similar cases, unless we possess the power of making the sun and moon stand still in their courses, we must have regard to the operation of natural laws, from which we can no more escape than we can from the air in which we breathe.

I may perhaps pass by the criticisms or even attacks on political economy by those whose schemes of action appear to contravene its principles. It has been called a "dismal science." But to a bankrupt, arithmetic is a dismal science, while to a successful trader it may be a source of daily satisfaction. Sciences cannot be dismal

or wicked; it is only men that can be joyful or desponding, or good or bad.

Having thus endeavoured to the best of my ability to protest against the idea that economics is not a science, but a mere collection of copybook aphorisms that may be used at random like quack medicines, I should like, with your leave, to endeavour to establish its claim to come among the exact sciences by the surest test that can be applied—namely, its capability of being demonstrated by means of geometry and mathematics.

I know here that I touch on delicate ground. I fear that there are many to whom the very name of geometry is repellent. The cause of this generally is that in their youth mathematics was presented to them in a totally indigestible form. It was like a vegetable diet is to a cat—the intestine was unfitted to assimilate it. I would, however, ask such persons, if any of them be here, to exercise their sense of fairness. How many boys who are totally incapable of comprehending any poetic idea are subjected to a steady course of English poetry in the board schools, and of Latin poetry in the public schools. The process is painful, but it is believed to do them good. Seeing then that I am, so to speak, in the pulpit for a short time, I will ask those who dislike mathematical reasonings patiently to listen in their turn while I try to expound the doctrines of supply and demand in a geometrical form—a form familiar, I have no doubt, to many of my audience, but very useful to illustrate my present theme: a form first designed by Cournot, but subsequently developed by other workers.

I will commence by saying that for the comprehension of this method no previous acquaintance with mathematics or geometry is necessary. One can work straight from first principles, and this mode of considering the problem has been so helpful to many persons that I believe it will find favour in the eyes even of opponents. Moreover, in so far as it is correct, it certainly helps to prove the proposition with which I started, that economics may claim to have entered upon the positive stage.

Everyone in this room is no doubt acquainted with the machine known as a barograph or registering barometer. There is one on the table. It is constructed as follows: A vertical cylinder covered with white paper revolves once in a week. A light arm is hinged on to a series of hollow elastic circular chambers, from which the air has been pumped out. As the pressure of the atmosphere varies, the air chambers dilate and contract, carrying the arm with them. The arm carries a pen which marks with a dot on the paper the height of the barometer at any time. As the paper moves the dot is drawn out into a line, which gives a continuous record of barometric variations. This diagram is a picture of one of the records.

Now, a little consideration will show what a useful diagram we have here. If we were to attempt to give the information contained in it in words we should have to say something like this. On Monday at 0 a.m. the barometer stood at 28.8 inches; during the morning of Monday it rose until about 2 p.m., when it remained

stationary for three hours. It again steadily rose in the evening, until at midnight it stood at 29.9 inches (fig. 1). On Tuesday it

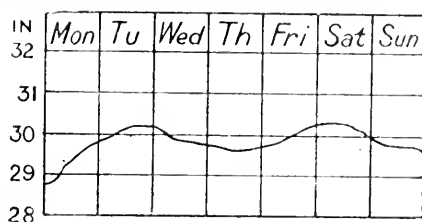


Fig. 1.

still continued to rise till midday, when it again experienced a fall, &c., &c. Or, if the same results were put into arithmetical form, we should have quite a column of figures.

But this diagram shows us the height of the barometer at any time and all its fluctuations. Its life history for the week and the law of its variations are obvious at a glance, in a way which no words could convey to us. So great are the advantages of this method that barographs are printed in many of the newspapers.

But the use of such curves is not confined to the registration of atmospheric pressure or temperature; they may be used for all purposes. Thus, for example, we might have a curve indicating the variation in successive years of the number of marriages per head of the population.

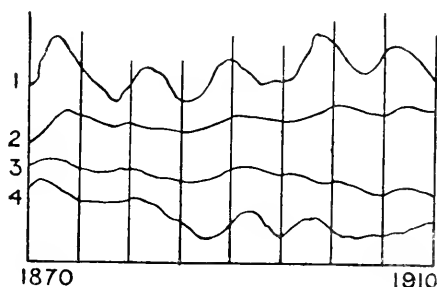


Fig. 2.

Line 1 (Fig. 2) shows the proportion of marriages to population from 1870 to 1910. The advantages of this synoptic view are obvious; but they become more obvious still when we add other curves. For instance, line 4 shows the price of wheat in various years, line 3 the price of coal, line 2 the average of money wages, and line 1 the number of marriages per head of the population. A simple inspection shows that these curves rise and fall sympathetically, and proves beyond doubt that the facts they represent are causally connected.

How eloquently this diagram represents, on a space that in a printed book may be three inches square, a series of relations

which would take three or four pages to describe even imperfectly in words. And would any description in words enable us to follow the changes like this diagram? The diagram, in fact, plays the part that maps play in geography, and when duly appreciated becomes as valuable as maps of countries.

We may use similar diagrams in the exposition of economic facts. It was, however, reserved for Cournot to show that the use of curves might go further still. Not only might they be used to display statistical facts, but they might also be used to solve problems. I will endeavour to illustrate this very ingenious and interesting development.

It is a well-known fact that in certain departments of industry the cost of making an article increases in proportion to the number produced. The growth of corn is a familiar example of this principle. The principle depends on two facts: (1) that corn can be grown in some places with a less expenditure of capital and labour than in others; and (2) that the quantity of the more favourable land is limited. Whence it follows, that growers will first have recourse to the most fertile land; afterwards, to that which is less fertile. If we were acquainted exactly with the economics of corn-growing, we could represent this state of things in any country at any given time by a curve like a barograph.

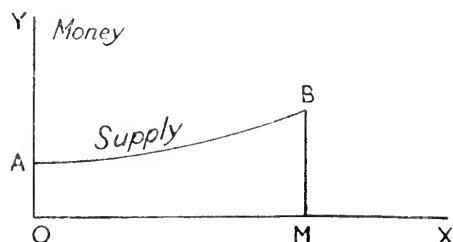


Fig. 3.

Along the line OX (Fig. 3), instead of the progressive days of the week, we should mark off successive quantities of corn; and the vertical height of the curve above any given quantity would represent the price per quarter of production of that part which was produced at greatest expense. Thus, the cost of production of the first and most easily-grown quarter would be, say, 18s.; of the next, 18s. 10d., and so on. And it would be evident that the total cost of the whole of the wheat grown would be obtained by adding all these prices together—that is to say, by the area of the curve OMBA; for an area is but the sum of all its constituent parallel lines, just as the total of a bill for goods is an addition of all its items.

Let us now dismiss this corn-growing graph from our minds, and turn to another side of the question. Let us consider the various prices which consumers would give for various quantities of corn if they could get these and no more. I do not mean the market prices of the quantities, but what might be called the famine prices—

which they would give rather than not have the corn. If we draw a corn-consumer's graph, it will obviously be a descending curve; for the more they can get the less they will value successive portions. In fact, if the supply of corn were unlimited, the surplus would be used first to feed animals, then to consume as fuel, then as manure, and at last have to be destroyed as a nuisance.

The curve would be of the form shown in Fig. 4.

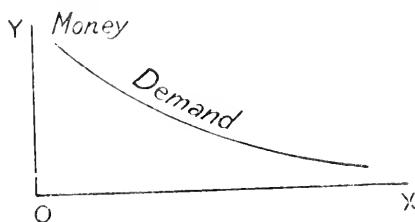


Fig. 4.

The contemplation of these curves of corn will no doubt suggest the question whether, if we had them both, we could tell what the market price would be. For it seems obvious that, if we know all the conditions both of demand and supply, we ought to be able to foretell the market price. This is the case, and can be easily done. All that is necessary is to superpose the curves, as is done in Fig. 5.

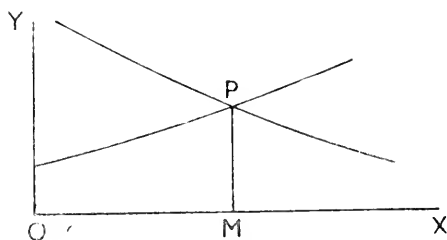


Fig. 5.

We then see at once that PM must represent the market price of corn per quarter at a given epoch, and OM the quantity produced in a standard time. For if more than OM were grown, it could only be sold at a loss; if less, the growing of corn would produce an abnormal profit, which would soon cause an expansion, so as to bring the quantity grown and sold up to the maximum that could be profitably produced.

These diagrams have therefore done more than present a state of facts; they have solved a problem, just as could be done by a pair of algebraic equations.

Moreover, other illustrations can be derived from Fig. 5. By drawing the series of lines shown in Fig. 6, meanings can be given to various parts of the diagram. The area $NPMO$ represents the total price paid for the corn; the area $APMO$ represents the total cost of growing; the area APN , which is the difference between

them, represents the surplus profit obtained from the use of the better lands, or, in other words, rent; the area $BPMO$ represents

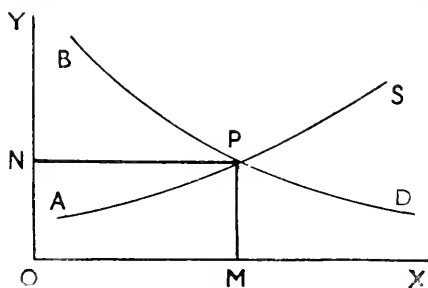


Fig. 6.

the total enjoyment the consumer derives from the corn, expressed in terms of money; and since $NPMO$ is the price he pays for it, BNP is the surplus enjoyment he gets by obtaining corn for less than he would have given for it had there been a famine.

Let us go a little further. Suppose that a tax were laid on corn, and that all corn grown in a country were subject to an excise duty like that now levied on the manufacture of spirits. Suppose the duty were 5*s.* a quarter, and, to simplify the problem, suppose no corn came in from the outside. Then the curve APS (Fig. 7)

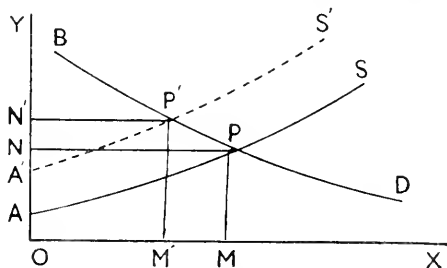


Fig. 7.

would be pushed upwards all along its length by 5*s.*, and assume a position $A'P'S'$. And notice that the price would rise, not by 5*s.*, but by some amount rather less than 5*s.* For $M'P' - MP$ must always be less than the upward movement of the curve APS . Again, the rent would be decreased; for the area $N'P'A'$ is less than NPA . The amount grown would decrease from OM to OM' . The proceeds of the tax would be OM' times 5*s.*, and the consumers' surplus of enjoyment would have considerably diminished. This is all obvious enough if you look at the curves. But I want to ask whether, without a curve, you could have got all that so quickly by logical cogitation? I agree it could have been done by hard thought; but what a help the diagram has been in thinking it out! It is like drawing a genealogical tree when you are thinking out some complex problems of family relationship. A simple inspection

of the figure also shows that an *ad valorem* tax on rent would not increase price or diminish production.

Again, what is a monopoly? A monopoly is simply a power of stopping production at a point short of that which it would reach under conditions of free production, sale, and distribution. You can stop production by means of statutes regulating quantities produced, or by combinations to limit production, or to limit the supply of labour produced, or by statutes regulating the employment of capital, or by statutes fixing minima of wages, or in various other ways. If you exercise the power, then the state of things shown in Fig. 8 comes into play. The quantity produced is reduced to OM'.

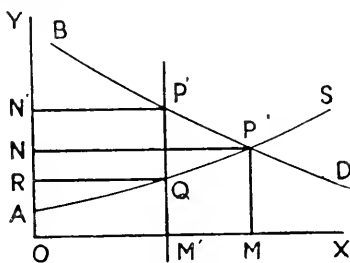


Fig. 8.

The price rises from PM to P'M'; the surplus producers' profit (including rent) rises from ANP to AQP'N'. So that profits, interest and wages increase, but the consumers' surplus enjoyment goes down from NPB to N'P'B. The limitation of output plays a far larger part in the regulation of prices than is commonly supposed. Those who are engaged in the manipulation of the meat trade, and the bread trade, and the petroleum industry, the supply of machinery or other articles, do not usually advertise the means they have taken to limit supply; nor do trade unions publicly descant upon the means they adopt to limit the labour of adults or apprentices. It is no part of our business here to discuss the necessity or the legitimate limits of such limitations. All that I am here to do is to show how useful diagrams are in explaining their effects.

The monopoly controller seeks, of course, to make the area AQP'N' a maximum, arranging his price just in the way a milliner would do who had to cut the biggest square she could out of a remnant of cloth. How much reduction of output and increase of price will the market bear is the question that all monopolists present to themselves.

I could go on with these curves through a great variety of questions. They become especially interesting where applied to show the effects of tariffs upon export and import trade. But I must forbear.

My principal object has not been to introduce to the notice of the audience a subject already known to many of them, but rather to use it as an illustration of the truth that national economics is subject to laws—laws which, though complicated, are as exact and

unfailing as the laws of physics, chemistry, or engineering, and which, if neglected by political engineers, will as certainly bring the State to ruin as the miscalculation of a mechanical engineer in designing a boiler, or of a civil engineer in designing a bridge. Whence, then, instead of consigning economics to Saturn, let us study it—not in a metaphysical or Aristotelian manner, using question-begging epithets; or, on the other hand, in the manner of some moderns, as for example, Ruskin, by replacing reason by sentiment—but let us approach it in the spirit of positive science.

The Editors have received the following communication from Sir Henry Cunynghame:—

Since the above address was delivered, I have been surprised to find that some of my friends have considered it a profession of materialism.

During the progress of metaphysics three systems have, among others, been evolved—materialism, idealism, and the philosophy of the absolute. Of these systems, the most obviously defective is materialism; for “matter” is a word conveying no intelligible meaning from an ontological point of view. Materialism has usually been professed by those who have not comprehended the nature of the problems presented by ontology or else by persons of depraved morals. Idealism presents less difficulties, but it has the disadvantage of ignoring the most primary fact of consciousness, namely, the distinction between the ego and non ego. The only metaphysical system that appears logically consistent is that of Hegel. But, unfortunately, at the best, Hegelism is only metaphysics, not science. We ask for knowledge, and it presents us with a word. The great danger of metaphysics is the taking of words for concepts, and phrases for facts. Ill-directed classical education, by over-rating the importance of the study of words, seems especially likely to induce an undue reliance on metaphysics. In this respect none of us are free from the bondage of metaphysics, and the lower and unthinking classes seem to be wholly dominated by it.

My remarks, therefore, were in no way intended as disloyal to Hegel, but were aimed at the general practice in the social and political sciences of accepting dogmas and catchwords without examination. For a state is never in so dangerous a condition as when it is overrun with sophists, and when inflamed passions are united with confused metaphysical ideas.

THE NATION'S FOOD SUPPLY.¹ By R. H. REW, C.B.

EARLY in 1816 the old Board of Agriculture (with which the name of Sir John Sinclair is so intimately associated) considering it “an incumbent duty to the public to take the necessary measures

¹ Paper read before Section M of the British Association, at Dundee, September 6, 1912.

for ascertaining the real state of the kingdom, in whatever most intimately concerned its agricultural resources," sent out a circular letter of enquiry "to every part of England, Wales and Scotland." The replies received presented a doleful picture of agricultural calamity and among the causes which had contributed to disaster was what a Scottish correspondent termed "an excessive glut of agricultural produce beyond the wants of the country." The imports of wheat and flour in 1815 were less than 500,000 cwts., of butter 125,000 cwts., and of cheese 107,000 cwts., while imports of meat were prohibited. The average price of wheat was 65s. 7d. in 1815 and 78s. 6d. in 1816 and the wholesale price of beef and mutton was from 7d. to 8d. per lb. in 1815 and from 6d. to 7d. per lb. in 1816.

It would be interesting to speculate as to the terms in which the Scottish pessimist of a century ago would describe the quantity of agricultural produce now annually supplied to meet the wants of the country.

In these days of popular statistics it may perhaps be thought that anyone who has access to the ordinary sources of information can, with a very trifling arithmetical effort, state at once the total quantity of food consumed by the nation. As a matter of fact the figure is not known, and indeed in a literal sense cannot be known. In the last resort it can only be an estimate and an estimate which, however carefully compiled, must be very approximate. The reason is apparent. Statistics are collected at the ports of all our overseas supplies, but for the food supplies produced at home there are no complete returns. Estimates of a very large part of the home supplies have recently been made in the Report on the Agricultural Output issued by the Board of Agriculture and Fisheries, but these cannot in the nature of things be exhaustive. Until we can calculate the amount of food grown or produced on private premises and consumed in the households of the producers, we cannot claim to make an accurate or complete statement of the food of the nation.

At the outset, it is necessary to define what we mean by food. In the Trade Returns one of the main groups in which imports and exports are classified is "Food, drink and tobacco." There is little difficulty in excluding the last item, for the most ardent devotee of My Lady Nicotine will shrink from contending seriously that tobacco can be classed as a food. At first sight it may also seem easy to exclude drink, but it is not quite simple. We may perhaps avoid controversy by excluding at once all alcoholic liquors, but are cocoa, coffee and tea also to be excluded? Even if we were to exclude them as doubtful, we are still left with one drink to which none can deny the claim to be classed as food, viz., milk. In the Trade Returns grouping the term food includes not only human food, but the imports of such grains as barley, oats, buckwheat, maize, &c., which are only to a very small extent used directly for human food. It is evident that there is no ready-made definition by which we can make an unchallengeable list of articles of food, and we must, therefore, for the purposes of discussion, define the term for ourselves.

I propose to deal in this paper only with such commodities as are directly consumed as food by man, excluding alcoholic liquors (with

substances such as malt, hops and yeast, which are mainly or solely used in their preparation), but including cocoa, coffee, tea and milk.

To confine the subject within reasonable limits we must deal with only the main groups of commodities and ignore for the most part details of separate articles. But there is one commodity at any rate which must stand by itself. It is that which represents the staff of life and is often spoken of as though it were the sole food of the people. The average annual expenditure on imported Wheat and flour during the past five years was 46,500,000*l.*, or rather more than 20*s.* per head of the population. Fifty years ago the corresponding expenditure per head was 12*s.* 6*d.* In 1911 the total cost of imported wheat and flour was 44,187,000*l.*, and if to this be added the value of the home crop, or at least that part of it which is made into bread, the total value of the wheat supply was over 55,000,000*l.*, or, deducting about 1,000,000*l.* for exports, an expenditure of 54,000,000*l.*, or say a little over 1,000,000*l.* per week. This represents a total quantity of 138,670,000 cwts., or about 343 lbs. per head of the population, assuming that all imports are used as breadstuffs, but allowing a deduction for seed and tail corn from the home crop. The supplies come mainly from seven sources outside the United Kingdom, and the quantity and proportion from each are summarised in the following table. I have added to the figures for last year the average figures for the five years 1907-11.

	1911.		Average, 1907-11.	
	Million cwts.	Per cent. of total.	Million cwts.	Per cent. of total.
United Kingdom	29·29	20·7	26·83	19·1
Australia	14·53	10·3	10·59	7·5
Canada	18·91	13·4	18·37	13·1
India	20·23	14·3	14·81	10·5
Other British possessions.....	0·73	0·5	0·42	0·3
Argentina	14·87	10·5	20·82	14·8
Roumania	2·06	1·5	1·51	1·1
Russia	18·11	12·8	16·30	11·6
United States.....	20·05	14·2	27·26	19·4
Other foreign countries	2·55	1·8	3·73	2·6
Total	141·33	100·0	140·64	100·0

The variations in the sources of wheat supply from year to year are often considerable and it is, therefore, inadvisable to draw conclusions from one year's figures. India is perhaps the most uncertain and the supply from thence, which amounted to over 20 million cwts. last year, was in 1908 less than 3 millions. From Russia, which sent 18 million cwts. last year and nearly 29 million cwts. in the previous year, we received in 1908 only 5 million cwts. The supply from Argentina ranged from nearly 32 million cwts. in 1908 to less than 15 millions in 1911, while from the United States the supply fell from nearly 40 million cwts. in 1908 to 18 million cwts. in 1910. The United States, indeed, must be regarded as a diminishing exporter of wheat. The most trustworthy of our

present sources of wheat supply is Canada. During the five years 1907-11 the quantity sent from the Dominion ranged from 15 to 20 million cwts. and, on the whole, it tends steadily to increase. It is noteworthy that during the twelve months ending July last (the "cereal year" 1911-12), Canada exported more wheat than any other country in the world, and it was further noted in the *Corn Trade News* that the combined exports of the British Empire, viz., from Canada, Australasia and India, during that period would have been more than sufficient to supply the United Kingdom with all its requirements of imported wheat had it all been sent here. As it was, we received 38·5 per cent. of our total supplies in 1911 from British Possessions, so that, if we include our home supply, about three-fifths of our breadstuffs came from within the Empire.

Of the imports which are classed in Trade Returns as "grain and flour," amounting in all to nearly 76,000,000*l.*, when we have dealt with wheat and flour (44,000,000*l.*) not very much of the remainder comes under our definition of food. Including rice, farinaceous preparations, oatmeal, and one or two smaller items, I think that, allowing for exports, 4,000,000*l.* will cover all that we need take into account.

In quantity bread is much the largest item of our food bill, but in value Meat greatly exceeds it. Our carnivorous tastes are fairly catholic, though for some not very logical reason we reject horseflesh, but we retain our traditional predilection for beef, which (including veal) constitutes about 44 per cent. of our total meat consumption, mutton and lamb constituting about 23 per cent. and pig-meat about 33 per cent. Imports comprise live animals from Canada and the United States, and dead meat from various sources, the principal being Argentina, Denmark, Holland, the United States, Australia, Canada, and New Zealand. The home production of beef, veal, mutton, lamb, and pig-meat I estimate at about 28,000,000 cwts. This includes the output of farms in Great Britain and Ireland, with an estimate for the amount of pig-meat produced by allotment holders, cottagers and private persons whose pigs are not included in the agricultural returns. The chief sources of our meat supply, and the quantities forthcoming in 1911 and in the quinquennium 1907-11, are shown in the following table:—

Country.	1911.		Average, 1907-11.	
	Millions of cwts.	Per cent. of total.	Millions of cwts.	Per cent. of total.
United Kingdom	29·00	54·5	29·26	55·7
Australia	2·39	4·5	1·69	3·2
Canada	1·00	1·9	1·31	2·5
New Zealand	2·30	4·3	2·41	4·6
Argentina	8·45	15·9	6·17	11·8
Denmark	2·42	4·6	2·20	4·2
Netherlands	0·77	1·5	0·90	1·7
United States	6·04	11·3	7·94	15·1
Other countries	0·81	1·5	0·63	1·2
Total	53·18	100·0	52·51	100·0

In terms of value the proportions would be considerably altered. The total imports of meat, including lard, amounted in 1911 to 52,000,000*l.* of which 40,500,000*l.* came from foreign countries and 11,500,000*l.* from British Possessions. This sum is made up partly of the value of animals landed alive and partly of meat imported in the carcase. Exports of meat amount to about 2,000,000*l.* The valuation of the home meat supply is a difficult matter. On the whole the most satisfactory method is to take the value of the animals at the markets before slaughter, and this, deducting exports and allowing for hides, wool, &c., amounts to about 76,000,000*l.* Reckoning by value, therefore, the home supply would represent about 61 per cent. of our total consumption. The total average consumption of meat is 130 lbs. per head.

Poultry, eggs, rabbits and game may be regarded as part of the meat supply and of these our total imports amounted in 1911 to nearly 10,000,000*l.* The value of poultry and eggs sold from the farms of Great Britain is estimated at 5,000,000*l.* and to this must be added the large Irish production. There is obviously a very large production of poultry and eggs by private persons for their own consumption and a considerable quantity of the farm production is consumed on the farms. On the whole, with some allowance for the value of rabbits and game, I estimate the total home production under this head at 15,000,000*l.*, or about 60 per cent. of the total consumption.

Of Fish the total value landed in the United Kingdom by British vessels—which may be treated as the “home production,” although the supplies are drawn from seas as distant as the White Sea in the North and the Morocco coast in the South—was nearly 12,000,000*l.* and in addition fish to the value of nearly 4,000,000*l.* were imported, *i.e.*, landed by foreign vessels at British ports. On the other hand the exports of fish are valued at 7,650,000*l.*, leaving apparently a little more than half the total supply for home consumption. But the exports mainly consist of dried or cured fish (herrings largely predominating) and it would probably be reasonable to assume that if they were expressed in terms of fresh fish the value would not exceed 4,000,000*l.*, so that the net value of the home consumption may be placed at 12,000,000*l.*, of which one-fourth is imported.

Next in importance to bread and meat comes Dairy produce. The total value of butter and margarine imported in 1911 was 27,062,000*l.*, of cheese 7,140,000*l.*, and of milk (mostly condensed), 2,071,000*l.* After deducting exports the value of dairy produce retained for home consumption was 35,211,000*l.*

The value of butter sold by British farmers is not more than 3,000,000*l.*, but if we add the output of butter factories in Great Britain and the production in Ireland, and make a rough estimate of the quantity made and consumed by British farmers and private persons, the total home production probably amounts to over 13,000,000*l.*, or about 30 per cent. of the total consumption. Denmark supplies about 23 per cent., Holland about 13 per cent. (mostly margarine), Australia about 12 per cent., Russia about 8 per cent., and New Zealand about 4 per cent.

It appears probable that the consumption of cheese in this country has been materially reduced in recent years. The imports per head of population in 1911 were smaller than in the previous year and about 1 lb. per head smaller than they were ten years ago, but the reduction of the home supply has probably been even greater. The output of cheese by British farmers is calculated at not more than 500,000 cwts., and as there is practically no cheese made in Ireland and very little made by private persons, except, perhaps, a small quantity of soft cheese, this substantially represents the total home supply which is not more than about 18 per cent. of the nation's consumption. Canada sends us about 52 per cent. of our whole requirements and New Zealand 14 per cent., while 7 per cent. from the Netherlands and 5 per cent. from the United States account for nearly all the supplies obtained outside the British Empire.

The comparative smallness of the output of butter and cheese by British farmers is, of course, attributable to the ever-increasing demand for fresh milk, of which hitherto the home producer has retained a practical monopoly. As already noted, nearly all the milk imported is in the condensed form, but with the view of making a comparison I have converted these quantities into terms of fresh milk, and for the purpose of the calculation I have reckoned the small quantities of cream, separated, preserved and skim milk also as fresh milk. Making some allowance for private supplies, I reckon that the total consumption of milk in all forms in the United Kingdom amounted to about 913,000,000 gallons in 1911, of which over 95 per cent. was produced in this country. Of oversea supplies the Netherlands sent more than half and Switzerland about one-fourth (2·77 and 1·23 per cent. respectively of our total consumption).

The quantity of Fruit grown on agricultural holdings in Great Britain (exclusive of apples and pears used for cider and perry) is about 6,000,000 cwts., and the value, with a small addition for Ireland, is 4,500,000/. The production in private gardens as well as that grown commercially under glass is not known, while nuts, which may properly be included in this category, are also an unknown quantity. We may perhaps estimate the home production of fruit and nuts at a total value of 6,000,000/. The value of imported fruit and nuts is 16,000,000/., but of this total dried fruits (currants, raisins, figs, &c.) account for nearly one-fourth, and exotic fruits (bananas, oranges and lemons) for nearly one-third. The imports of raw fruit directly competing with home produce may be reckoned at about 5,000,000/. Apples represent by far the largest item of our fruit supply, Canada, the United States and Australia sending nearly all the imports. Oranges come easily second, and bananas third in the fruit diet of the nation.

Of Vegetables the farm production in Great Britain is calculated at about 11,000,000/., of which potatoes represent over 7,000,000/. Imports of vegetables amount to 4,000,000/.; potatoes, onions and tomatoes accounting for seven-eighths of the total. In some years there is a considerable exportation of potatoes, and in 1911 this amounted to 432,000/. The Irish production of potatoes is very large, and adding this to the produce of private gardens I am

disposed to estimate the total consumption of vegetables at 24,000,000*l.*, of which about 17 per cent. comes oversea.

To complete the items of the nation's food bill we must add 26,000,000*l.* for sugar. The total imports of the beverages, tea, coffee and cocoa which I propose to include as food, amount to 18,500,000*l.*, but the exports amount to over 5,000,000*l.*, so that the home consumption is about 13,500,000*l.*

From this very rapid survey we are now able to summarise the nation's food supply in terms of money. Dividing home production from imports and deducting exports, we get the following statement of the value of food consumed in the United Kingdom :—

	Home produce.	Imports.	Total.
	Million £'s.	Million £'s.	Million £'s.
Wheat, flour and grain	10	48	58
Meat	78	51	129
Poultry, eggs, rabbits and game	15	10	25
Fish	9	3	12
Dairy produce	42	35	77
Fruit	6	16	22
Vegetables	20	4	24
Sugar	—	26	26
Tea, coffee and cocoa	—	13	13
	180	206	386

If we deduct the two last items, for which there is no corresponding home production, it will be observed that the total of imported food is valued at about 13,000,000*l.*, less than the estimated total of the home produce consumed. In other words the United Kingdom may be said to produce rather more than one-half of its total food requirements, exclusive of sugar and the beverages which may be regarded as necessities of civilized life. I have, I hope, sufficiently insisted on the fact that the calculations of home supplies are to a considerable extent estimated, and the margin of error in these figures is much greater than that which exists in the case of the values of imports. But another cautionary observation must be made in reference to the terms in which the calculation is expressed. There is practically no common measure except value which can be applied to all the items of the account; but it is not altogether a satisfactory measure for the purpose. In the first place, as I have indicated in connection with meat, the general level of price of the imported food is generally lower than that of home produce, so that the same amount of money may represent a larger supply in the one case than the other. Then it must be borne in mind what the values taken purport to be. The figures of imports represent the declared value (cost, insurance and freight) at the place of landing, not including, in the case of dutiable articles, the amount of the duty. The total net amount of duty charged on sugar, tea, coffee, cocoa and dried fruits is 10,000,000*l.* The value of home produce mainly represents the wholesale price of the raw product at the nearest market. It is clear, therefore, that the figures do not in any way represent the

amount actually spent by the consumers. Cost of manufacture, as in the case of wheat, of slaughtering and dressing in the case of live animals, and in all cases cost of handling and distribution must be added before the amount spent by the consumers could be ascertained. This calculation I shall not attempt. I must be satisfied if I have succeeded on the present occasion in giving some approximate indication of the magnitude of the nation's food supply and the relative proportions of its native and extraneous supplies.

SCOTTISH AGRICULTURAL CHANGES.¹

By Major P. G. CRAIGIE, C.B.

As a sphere of agricultural production Scotland offers a territory of 19,000,000 acres, of which fully 14 per cent. lies 1,500 feet and upward above the level of the sea, and nearly one-half of the measured surface is made up of rough hill-grazings rising in part over that level. This leaves for permanent cultivated pasture, for rotation grasses and clovers, and for the surface over which the plough can annually range—not quite 5,000,000 acres. This “cultivated area” can be shown to have varied in the last half century, if the statistics of the Highland and Agricultural Society in 1854–56 be taken as the starting point. The section regarded as arable appears, however, to be somewhat less now than half a century ago.

The Highland Society's inquiry returned originally 3,500,000 acres under this category on the holdings then embraced, which were those in the occupation of 43,000 farmers, but a supplementary investigation, which extended to 42,000 smaller holdings (under 10*l.* rental in most, and under 20*l.* in certain counties), added to this total another 238,000 acres, bringing the arable total to close on 3,750,000 acres. To-day a similarly exhaustive inquiry shows some 350,000 acres less than this. The decline was not, as in England, a continuous one, attributed to agricultural depression. The striking reduction in Scotland occurred in the decade immediately following the 1854–56 inquiries. Between 1856 and 1866, when the official Agricultural Returns began, as much as 390,000 acres of arable land appears to have passed out of that category.

Some incompleteness may be assumed in the very early years of the official statistics, and a more exact comparison in quinquennial periods from 1866 onward shows that, after the decade referred to, the arable area was increased. On a five-year average up to 1870—only 3,360,000 acres could be regarded as arable. This figure rose to 3,670,000 acres in 1886–90 and did not fall below 3,500,000 acres till the twentieth century opened. It was 3,460,000 acres in 1901–05 and just under 3,400,000 in 1906–10, and therefore at the date of the new Census of Production. The earlier changes between 1854–56 and 1866–70 included a diminution coincident

¹ Summary of a paper read before Section M of the British Association, at Dundee, September 6, 1912.

with the abandonment of a large area of wheat after the abnormally high prices of the Crimean War disappeared.

As many as 263,000 acres were shown as under wheat in Scotland in the Highland Society's returns of 1856; and that there was more than this in existence is apparent, since the smaller holdings, on which the individual crops were not distinguished, presumably grew some acres, at all events, of that cereal. The first official inquiry, embracing some 80,000 holdings, both large and small, gave only 110,000 acres of wheat. That was a drop of more than 50 per cent. in the crop on the whole, and the fall was even more striking in individual counties. Aberdeenshire's 15,300 acres of wheat shrunk to less than 600 acres; in Forfar, 25,500 acres dropped to 11,000 acres; in Wigtown, 11,000 acres to 3,300 acres.

The later changes, which we can measure more exactly from 1870 to 1910, show that some 200,000 acres of grain were lost, including another 74,000 acres of wheat; there were nearly 100,000 acres of turnips and potatoes less, but apparently a growth of nearly 200,000 acres of rotation grasses. If crop areas are less the yields are all higher, and the wheat crop of the Census year 1908 reached 41 bushels per acre against less than 28 in the fifties, barley 36 against 33, and oats 39 against 32, while the potato yield of under 4 tons reached 7 tons in 1908.

Meanwhile the cultivated grass returned as permanent pasture has gained largely. Less than 900,000 acres were shown in 1866; a million acres were noted in the following year. A slower rise brought it up to 1,200,000 acres in 1884, 1,400,000 acres was reached when the century closed, and 1,500,000 acres is returned now. This rise is relatively greater than that often commented on in England, and official testimony is forthcoming that it was largely the result of reclamation, for the "laying down to grass," although a feature in some areas, was relatively small. No doubt the quality of much of this grass is low, and only 10 per cent. of the permanent grass of Scotland is now cut for hay, against 39 per cent. in England. Nevertheless, when this notable extension, as well as the larger area of rotation grasses and the vast range of 9,000,000 acres of hill pastures are considered, the "grass" of North Britain covers 12,000,000 acres, or six times the area of all other crops, and raises the question, has it been justified in the out-turn of animal produce.

The cattle maintained in 1854-56 in Scotland exceeded 1,000,000 head. They rose to 1,157,000 in 1884-86, exceeded 1,200,000 head for 1890 to 1906, stood at 1,174,000 in 1908, and are again at 1,200,000 now. This gives no extension in the last 20 years, and the stationary character of the breeding stock of cows in Scotland is unsatisfactory. The record of the flocks is better. The sheep of 1854-56 only numbered 5,900,000. By 1884-86 they reached 6,848,000, reached a maximum of 7,623,000 in 1891, and with only two drops below the seven-millions level were 7,439,000 in 1898, and are still 7,164,000. Herein the Scottish flocks maintained a superiority over all those of Western Europe, where the loss of sheep was large and significant. The pig stock of Scotland has always been a very small factor, but the level of 1908 at 144,000 head was at least above

the total of the fifties, and is to-day over 170,000. These totals, however, are less than a single English county could show. Scotland has not one pig for 10 in Denmark or one for 150 in Germany.

In the light of the new Census the entire saleable output of Scottish agriculture, however, only reaches 23,150,000*l.* per annum. The farm crops so far as sold account for over a fourth, or 6,400,000*l.*, the animals and animal products 16,250,000*l.*, with 500,000*l.* from "fruit, flowers, and timber," of which the fruit is about two-thirds. What these figures teach is a problem worthy of attentive study. They include the timber sales, calculated at 181,000*l.* on 875,000 acres. But these reach only 4*s.* 2*d.* per acre. If this be deducted, there remains an agricultural area of under 14,000,000 acres which would appear to return less than 33*s.* per acre. The Census report suggests that the rough grazings, of which Scotland shows 9,080,000 acres in its utilised area, can be reckoned to yield only 10*s.* to 12*s.* an acre of saleable output, if indeed this figure is not too high, and it is no doubt this item which so lowers the aggregate return.

To arrive at a closer idea of the returns of more ordinary farming, we could indeed deduct the 4,540,000*l.* attributed to these grazing lands, withdrawing at the same time their 9,080,000 acres from the other side of the account; and, similarly, for an opposite reason, we might exclude the 8,000 or 9,000 acres of exceptional lands contributing the fruit sales at an apparent rate of some 37*l.* per acre. This would leave 4,856,000 acres of ordinary "cultivated land"—of which, however, five-eighths are still under grass, and we should then arrive, on the basis of the Census of Production figures, at an approximate return of 3*l.* 14*s.* 8*d.* per acre. Could we go further and apportion the share of this to be credited separately to the grass and the arable land, the result would be of much interest and significance. Such a calculation, however, includes too many items of uncertainty and complication to be of practical value, and it would devolve on the statistician estimates for which we have as yet no exhaustive data respecting the charges for purchased foods and manures, for equipment and for labour, at the cost of which the out-turn of saleable products is secured.

Without entering on this task, the figures I have quoted illustrate the trend of Scottish agriculture in the past half century, and once more emphasize the increasing predominance of the grass areas, and the extreme importance of all that science and practice can teach us as to the modes of effective development of their productive capacity. Nor is it the large farmer and sheep owner who is alone concerned in such inquiries, for the latest returns bring out the fact that the small holders of to-day have relatively a larger interest than the others in share of grass, and especially of rough grazings that they now farm. These features have to be reckoned with in any survey of the remaining scope for agricultural development, and give point to the directions in which the prospects are most hopeful.

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*The progress of the Nation*. By G. R. Porter. New edition, by F. W. Hirst. xvi + 735 pp., 8vo. London: Methuen and Co., 1912. Price 21s. net.

To judge by the honourable scars borne by the copy of Porter's work in our library there are probably few of us who have not had occasion to dip into it from time to time for information regarding the material progress of the Kingdom during the first half of last century. Nowhere else is that information to be found in a form so comprehensive and easy of access, bearing, too, so apparently the hallmark of sound statistical treatment. All will rejoice, therefore, at the reappearance of an old friend, rejuvenated and clothed in the latest fashion. The current of improvement which had already set in strongly by the middle of the century has since that period branched off with increased vigour into channels, the volume and direction of which are beyond the scope of the most sanguine vaticinations of 1850. On the other hand, several of the older outlets have dwindled, contrary to expectations, or have been diverted elsewhere. Obviously, therefore, the work in its original form was not well suited to the new conditions, and the necessary alterations have been carried out judiciously, preserving nearly all of the most characteristic and permanently interesting portions of the original. The principal feature in the modification is the greater prominence which has to be given to manufacturing industries, many of which were in their infancy when Porter wrote, and others not yet even in existence. The new chapters dealing with these form the most valuable part of the work for practical reference, and

provide, as a rule, the most recent information from the most trustworthy sources. The review of the moral and, so to speak, personal conditions of the last sixty years is very interesting, and probably as complete as is to be expected from the data available, but it stands, statistically, on a slightly lower plane than that of the more concrete and measurable factors in national life. In the treatment of trade, finance, and fiscal policy, the controversial element is a little too prominent to secure for this part of the work the same confidence that may be felt in the rest. In the original work a considerable space was assigned to Greater Britain and its commercial relations with the Mother Country, upon which Porter set a high value. In the new edition this part does not appear, and the editor is no doubt amply justified in its omission in view of the more immediate relevance of the remarkable development of home industries. Nevertheless, the position of this country as the centre of a widespread Empire is a factor in its progress and probable future deserving of more recognition than is here accorded to it. A general summary of the progress and tendencies during the period embraced would no doubt be desirable, but, considering the vast amount and variety of detail, it would be very hard, if not impracticable, to effect this within the space available. In compensation, however, a very full and effective index enables the reader to make the most of the great multiplicity of references. In regard to the sources of the information upon which the author and editor respectively rely, the aim of Porter, as of his successor, has been to base this review, as far as possible, upon material obtained from official records. In Porter's time, however, not only was that material, as a whole, comparatively sparse, but the labour in compiling it—and, it should be added, the statistical judgment required to sift out the really trustworthy data, and to marshal them in a way to bring out their true meaning—was necessarily far greater than that involved in the corresponding processes in the present day. The impress of the individual mind, therefore, upon, at all events, the principal branches of the subject, is more apparent in the earlier work than can reasonably be expected to pervade the much greater detail of the field surveyed in the new edition, where it is mainly traceable in certain special subjects. As to the rest, ample advantage has now been taken of the long series of annual returns available, as of the more detailed information afforded by the reports of Commissions, the Census of Wages and Production, and other special investigations. The extensive use made of the work recently done by Fellows of this Society would be dear to the heart of one who was himself amongst the most distinguished of our original Members. In several instances, indeed, it may be thought that this use might even have been extended with advantage. In regard to the treatment of long annual series, again, the opinion of statisticians has always varied, but there is a fairly general distrust of the single-year quotation in illustration of some continuous tendency, which is found here as in many other works. On the whole, however, the statistics are here handled so as to serve thoroughly the purpose for which they are adduced; and though a more minute and

comprehensive analysis might support some qualification of the conclusions drawn from them as they stand, they suffice to show up the difference, in the main, between the earlier and the later dates to which they relate.

From the standpoint of literature the earlier edition is the more attractive, in spite of the occasional "diffuseness and verbosity" which has been judiciously excised or pruned in the later. For one thing, Porter had chronology on his side. He dealt with a period beginning with fifteen years of continuous war, the succeeding generation enjoying a long spell of profound peace. The present editor, on the other hand, had his fair wind at the outset, interrupted by only a comparatively slight squall or two, furnishing convenient texts for reflection; and his cardinal point, the Boer War, comes so near the end of the narrative that it renders his pæan on the last few years somewhat of an anti-climax. Porter, again, was not only an optimist, but an enthusiastic advocate of a fiscal policy which he had the gratification of ultimately seeing adopted, and which, during the few years left to him, was followed by material prosperity equalling, if not exceeding, his anticipation. His strongly expressed hopes and opinions have now been tested by time, and can be appreciated in the light of subsequent events. His successor has to deal, not only with these events, but with contemporary controversy about them, in which it can hardly be expected—certainly, not of a publicist—that impartiality should be strictly observed. One takes up Macaulay's *History*, it is said, with one's feet on the fender, in the comfortable assurance that the Tories are going to have a bad time of it. Something of the same sort can be said of this work, especially in its most recent form, in regard to matters prominent in party politics; and several of the chapters undoubtedly lose much of their weight from the strong bias they display, and the one-sided and rather immature presentments of important public questions. Undeviating loyalty to the doctrines of 1846 in fiscal policy is of course to be expected, if only out of respect to the memory of the author of the work, and the discussion of possible changes in that policy is strictly on the old lines, and will comfort the elect without causing undue anxiety in the ranks of the blasphemers. On the subject of the naval and military expenditure of the country the two editions stand further apart. Whilst both writers are at one in forcibly pointing out the disastrous economical effects of war and the financial burden imposed by the maintenance of the Navy and Army, Porter recognizes that the wars of which he treats were forced upon this country, and that we had no alternative but to carry them out to the bitter end. To Mr. Hirst, on the other hand, the defensive forces of the Empire are merely pawns in "artfully worked scares," "panics ingeniously organised by politicians," and exploited by contractors to the War Office or Admiralty, and are destined, apparently, solely for the aggressive purposes of "spirited foreign policy." The authority of Sir Robert Giffen is so often quoted with approval in these pages that it is not out of place to call to mind, in mitigation of the wholesale condemnation of our present defensive expenditure here

set forth at considerable length, what that distinguished and broad-minded thinker said before us in 1903:—

“Defences of a certain quality and extent have to be found if the community is not to go under, and the question how much these should cost is really one for experts. Nor does a sum of 70 millions appear overwhelmingly burdensome for a community with an income and capital as great as has been described, the proportion of 70 millions to the aggregate annual income of the people being about 4 per cent., and to the accumulated wealth, on the calculation above made, about 0.47 per cent.—not a heavy rate of insurance.”

J.A.B.

2.—*The elements of statistical method.* By Willford I. King, M.A. xvi+250 pp., 8vo. New York: The Macmillan Company, 1912. Price 6s. 6d. net.

The publication of such a book as this is evidence of the growth of interest in statistical method, and of its increasing place in education; for the subject has passed from the stage of memoirs in learned journals, through treatises professing to deal with the theory of statistical science, to the region of text books, good, bad and indifferent. It is a little difficult to class this work; it is completely wanting in originality, except in occasional illustrations, being a compilation (sometimes nearly literal) from recent English, French, German and American authors, and in some cases the work is spoilt in transmission. On the other hand the selection is very judiciously made, the style is clear and convincing, and all the main topics and technicalities of arithmetical statistics, and that part of mathematical statistics covered by Elderton's *Primer*, are handled in due sequence. It may be recommended to American undergraduates as useful and substantially accurate.

The author's style is not above criticism; “The science of statistics is the method of judging collective natural or social phenomena from the results obtained by the analysis of an enumeration or collection of estimates” (p. 23), is an extremely confused definition, and not an improvement on those it succeeds. How can a *science* be a *method*? We find on p. 42 *Bertillon's* rule: “Always compare effects to the causes producing them” restated as “Be careful to so select the quantities used as numerator and denominator, in each case, that the quotients derived may be legitimately compared”; surely a perversion of excellent advice.

To take various details:—In illustrating the law of statistical regularity, we find that “If four dice are taken, the total number of spots on both sides is 28. On the average, half of these, or fourteen, should turn up each time.” The first clause is unintelligible, and the word *should* suggests a carelessness in dealing with the nature of chance. The treatment of averages is spoilt by too great reliance on the accuracy of the position of the *mode*, which in fact is seldom definitely determined except in mathematical curves. The rule for approximation given is, if l is the lower limit of the class that contains the mode, f_1 and f_2 , the *numbers* of items in the classes to left and right, and c the class interval, then the mode may be

taken as $l + \frac{f_2 c}{f_2 + f_1}$ (p. 124).¹ This is an unsatisfactory rule, and incapable of any but empirical justification. If, however, we base our interpolation on a mathematical formula, and take the parabola which contains the same areas in the three adjacent groups as the data give, then we have for the mode $l + \frac{d_2 c}{d_2 + d_1}$, where d_1, d_2 are the differences $f_0 - f_1$ and $f_1 - f_2$, f_0 being the number in the fullest class. This measurement (if it is not already in use) may be suggested for such cases.

The main advantage, and indeed necessity, of the arithmetic average, that two groups can be merged when these averages and the totals are given, while the medians and modes must be calculated afresh, is omitted. Where mathematical demonstrations are given, as in the proof of "The Short-cut Method for computing the standard deviation," they are prolix and rather confused. It is assumed too confidently that the measurement of dispersion, which, by universal consent, is generally taken as a concrete quantity, may equally well be taken as a fraction of the average, to which it is frequently quite unrelated. Under the new, and it may be hoped short-lived, word, *Historigram*, the author deals clearly with the trend and the fluctuation, but spoils his treatment by limiting smoothing to curves with nearly regular periods, whereas it is quite as useful and applicable (with discretion) to curves with any kind of fluctuations; and, further, to find a regular period he takes a record of mean daily temperature (year and locality not named) where maxima occur every seventh day! It shows some want of grip of the meaning of the correlation coefficient to say that "if r is less than .30 the correlation cannot be considered as at all marked" (p. 215), and ignorance of the process of constructing regression curves to believe that "it is found, in practice, that the points plotted are usually so widely scattered that a straight line approaches them all about as closely as any mathematical curve that can be found" (p. 222). It is to be regretted that the empirical method of estimating correlation by the square root of the excess of similar signs in movement over dissimilar, divided by the number of instances, is included, for this ignores a great part of the information, and has a very considerable and uncalculated probable error. But the author seems to have very vague ideas as to the meaning of probable error, or he could hardly write "If E = the possible error of the arithmetic average, the probable error of the same is E / \sqrt{n} ." The E in the formula should be, of course, the probable error of the items, whereas it is taken apparently as the average of the maximum errors possible.

On the whole there is a sufficient number of misjudgments and misunderstandings to injure the book seriously, but a very careful revision would probably make it a sound, useful and trustworthy work.

A.L.B.

¹ In a corresponding formula for the median, p. 129 last line, \times is unfortunately printed for $+$.

3.—*Calcul des Probabilités*. By H. Poincaré. Deuxième édition, revue et augmentée par l'auteur. 336 pp., 8vo. Paris: Gauthier-Villars, 1912. Price 12 frs.

Calcul des Probabilités. By Louis Bachelier. Tome I. vii + 518 pp., 4to. Paris: Gauthier-Villars, 1912. Price 25 frs.

Le Calcul des Probabilités et ses Applications. By E. Carvallo. ix + 169 pp., 8vo. Paris: Gauthier-Villars, 1912. Price 5s. 6d.

Wahrscheinlichkeitsrechnung. By A. A. Markoff. Translated from the second Russian edition by H. Liebmann. vii + 318 pp., 8vo. Leipzig: Teubner, 1912. Price 12 m.

There never has been a systematic treatise on the mathematical theory of probability published in England, and it is now nearly fifty years since the last substantial volume to deal with this subject from any point of view (Venn's *Logic of Chance*, 1st edit., 1866) was brought forth here. But a year seldom passes abroad without new books about Probability, and the year 1912 has been specially fertile. Apart from a small elementary text-book by Herr Otto Meissner (*Wahrscheinlichkeitsrechnung nebst Anwendungen*) and a treatise published in Vienna by Professor Josef Kozák (*Grundlehren der Wahrscheinlichkeitsrechnung als Vorstufe für des Studium der Fehlerausgleichung, Schiesstheorie und Statistik*), there are the four considerable volumes mentioned above, each of which in its own way is deserving attention.

Poincaré's *Calcul des Probabilités* originally appeared in 1896 as a reprint of lectures. This new edition includes the whole of the earlier edition, but is now rearranged in chapters according to the subjects treated, in place of the former awkward arrangement into lectures of equal length. It is also enlarged by the addition of an introduction on *Le Hasard* (the substance of which was originally published in the *Revue du Mois*, 1907), and of a final chapter on *Questions diverses*. Both these additions add considerably to the interest of the book. Poincaré's analysis of what we mean when we say that something has happened "by chance" is full of illumination. The phrase does not in ordinary usage, he points out, have reference to our subjective ignorance merely. If we discover on Tuesday that a certain phenomenon is explicable by reference to a simple law, we hold that it would not have been correct, even on Monday, to maintain that it happened by chance. After examining typical instances of what would ordinarily be regarded as chance occurrences, he concludes that their distinguishing feature is either that they are produced only by the coincidence of very numerous distinct causes, or that a very small variation in the cause has an overwhelming influence on the effect.

In the concluding chapter three distinct problems come up for discussion. In the first, he applies some beautiful and difficult mathematics to the question whether, after a pack of cards has been thoroughly well shuffled, all possible arrangements of them are equally likely; but I do not think that he gets much out at the end which he has not in effect put in at the beginning. The second problem, if without practical value, has much aesthetic interest for

amateurs of the subject. If we take a five figure table of logarithms, we are apt to conclude, with the support of the principle of non-sufficient reason, that it is an even chance whether the figure in the third decimal place is odd or even; and similarly for the figure in the last decimal place. Poincaré inquires whether *in fact* the aggregate of odd and even figures is approximately equal. For the *third* decimal place he is able to prove *a priori* that it is; but for the *fifth* decimal place his proof breaks down, and the matter remains doubtful. These proofs serve to elucidate certain general conditions for the solution of analogous problems. Lastly, he examines, without very positive results, the application of probability to the mixture of liquids and the kinetic theory of gases.

The rest of the book does not differ materially from the earlier edition, and calls for little comment. The mathematics remain brilliant and the philosophy superficial—a combination, especially in the parts dealing with geometrical probability, which makes it often suggestive and often provoking. On the whole there is not a great deal in the book which cannot be found, substantially, elsewhere. Poincaré had to lecture on Probability, and this is what without giving any very profound attention to the subject, he found to say. This new edition must have been almost the last material to leave his hands before his lamented death. The immense field of Henri Poincaré's achievements had made him one of the greatest mathematicians in Europe, and it must always be a matter of regret to statisticians that modern statistical methods, with their almost equal dependence on mathematics and on philosophy and logic, had not found their way to France in time to receive illumination from his brilliant and speculative intellect. This book has no reference to any of the researches, either German or English, which seek by the union of Probability and Statistics to forge a new weapon of scientific investigation.

M. Bachelier's volume is large, and makes large claims. His 500 quarto pages are to be followed by further volumes, in which he will treat of the history and of the philosophy of Probability. His work, in the words of the preface, is written with the object, not only of expounding the whole of ascertained knowledge on the Calculus of Probabilities, but also of setting forth new methods and new results which represent from some points of view "*une transformation complète de ce calcul.*" On what he has accomplished it is not very easy to pass judgment. The author is evidently of much ability and perseverance, and of great mathematical ingenuity; and a good many of his results are undoubtedly novel. Yet, on the whole, I am inclined to doubt their value and, in some important cases, their validity. His artificial hypotheses certainly make these results out of touch to a quite extraordinary degree with most important problems, and they can be capable of few applications. I do not make this judgment with complete confidence, for the book shows qualities of no negligible order. Those who wish to sample his methods may be recommended to read chapter ix, on what he terms *Probabilités connexes*, as a fair specimen of his original work.

Almost the whole of this volume is occupied, so far as the outward form of the problems is concerned, with gaming. But, of

course, many problems of quite different kinds, as M. Bachelier shows, can, if we like, be treated under the formulæ of gaming. He begins by giving solutions, sometimes in a simpler or more general form than has been given hitherto, of the principal classical problems about gaming. The value of this part is somewhat reduced by his giving no reference to other writers, even when he is borrowing from them. Save that on one occasion he calls Bernoulli's Theorem after Bernoulli, there is, I think, no single reference throughout the book to any other author. He then proceeds to the more original part of his work. The essential characteristic of this is, that he regards the total gain or loss of the gamblers at each point of the game as a continuous variable, which changes by infinitesimal increments, and he is thus enabled to make free use of the methods of the Differential Calculus. The consequence is that his results are only applicable when the number of sets played is very large, and then only approximately. He is certainly able to reach some kind of solution in some very complicated cases, but only at the expense of making highly artificial hypotheses. I am not clear that these hypotheses have not led him astray, and invalidated his argument at some important points. To give one example:—On p. 203 of chapter ix (to which the reader has been referred above) he seems to assume that certain quantities $m_1 m_2 \dots$ are *infinitesimal*, which are assumed in the formulæ of p. 201 to be *very large*. This is a book on which those who are interested in the Calculus of Probabilities for its own sake ought to form their own opinion, and which statisticians, who are chiefly interested in the practical applications of the Calculus, can safely neglect.

M. Carvallo's book is due, he explains in the preface, to the fact that candidates for statistical posts under the French Government have been examined on Cournot's *Calcul des Probabilités* as their set book, and that the results have been unsatisfactory. He has attempted, therefore, to write a text-book in which those parts of the subject, which have æsthetic rather than practical interest, are ignored, and in which little or no use is made of advanced mathematical methods. Instead of proving Bernoulli's Theorem, for example, he works out some particular examples calculated to make the Theorem appear plausible to a student. This part of his book is not, in my opinion, satisfactory. The author seems delighted with his own superficiality; but it makes one doubt whether it is worth while to expound in such a manner a part of the subject which is essentially mathematical. The whole of this covers, however, no more than 40 pages, and when he passes to statistical method there is a great deal well suited to his purpose. A section discussing the excess of male over female births may be specially mentioned as containing many interesting statistics, and is of considerable value as an original discussion of the question. A concluding chapter on the limitations of the Calculus of Probability is well written, and contains several warnings, such as every student ought to have, of the pitfalls of the subject and of some typical kinds of reasoning which have often led to fallacious and paradoxical results.

Professor Markoff's treatise has been translated from the second Russian edition, and his work is now made available to western readers for the first time. It is the work of a pure mathematician, who avoids philosophical difficulties on the one hand and practical applications on the other. But amongst books which treat the Calculus of Probability as a *mathematische Disciplin* (to quote his own preface), Professor Markoff's deserves to occupy one of the highest places. It is, in the first place, a great pleasure to read a treatise which is not influenced by the exhausted French tradition of mathematical probability, and is yet able to emulate the purity and elegance of French mathematical style. Professor Markoff is mainly under the influence of Tchebycheff, whose remarkable theorems on Probability—to which attention was called by the present reviewer in the *Journal*, vol. lxxiv, p. 646—are not very well known outside Russia. He not only makes available a much greater part of Tchebycheff's work than is discussed, for example, by Czuber, but also introduces some highly interesting extensions of it (see especially p. 67). The mathematical technique by means of which Tchebycheff and Markoff reach their conclusions is so distinct from that of other writers that it can fairly be held to constitute a distinctively Russian tradition. Amongst mathematical trifles may be mentioned his solution of the problem "to determine the probability that a fraction, whose numerator and denominator are any rational numbers chosen at random, will not be reducible by cancelling," though I do not feel perfectly sure that it is new.

Professor Markoff is always careful to make his hypotheses quite precise, and to avoid philosophical assumptions. Without solving logical difficulties, therefore, he succeeds in escaping, except in the discussion of Testimony, the commonest logical pitfalls. Although, apart from his extensions of Tchebycheff's work, Professor Markoff's book does not contain much that is notably new, it is throughout of high and distinguished quality. J.M.K.

4.—*Ueber das Geschlechtsverhältnis bei Zwillingsgeburten.* By Kazimierz J. Horowicz. 39 pp., 8vo. Göttingen: E. A. Huth, 1912.

This Inaugural-Dissertation aims at applying the statistical methods of Lexis to determine the stability of the sex ratios of twins in different Prussian districts. These important methods have been made use of so seldom by practical statisticians that a new exemplification of them deserves a brief notice. The empirical probabilities (or observed frequencies) of the three possibilities at twin births—"two boys," "a boy and a girl," "two girls"—are 0·3209, 0·3780 and 0·3011, these figures being based on the statistics of twin births in Prussia between 1887 and 1907.² Dividing Prussia up into

² These figures agree only moderately with those (quoted by Simon Newcomb) for France, 1898-1900, namely, 0·3369, 0·3541, 0·3090, which point to a higher proportion of "true" twins than in Prussia. But the French statistics only cover 28,312 cases, as compared with 325,079 dealt with by the Prussian statistics.

districts and for periods, Herr Horowicz seeks to determine whether the dispersion about the mean is *normal*—whether, that is to say, it is of a kind that might be not improbably anticipated if we could suppose that the conditions determining sex in these cases are analogous to the conditions which exist in a game of chance. Just as Lexis found that the statistics of sex ratios as a whole satisfy these conditions with wonderful accuracy, so Horowicz finds that the statistics of twin births satisfy them.

The practical value of this investigation is much diminished by the fact that the statistics do not distinguish between “true” twins and twins arising out of two independent conceptions, in the former case the sex of the two being necessarily the same. Assuming, however, that the sex ratios amongst “false” twins are the same as amongst single births, and that the sex of the two are not correlated, it is possible to determine what proportion of the recorded twins were “true” twins. On these hypotheses 24·4 per cent. were “true” twins.

Herr Horowicz thoroughly understands the Lexian methods, and this gives interest to his thesis, although his conclusions are probably of not much biological value. It may be added that his thesis begins with a brief but well-documented account of the development of theories of sex ratio.

J.M.K.

5.—*Manual of railway statistics.* By George L. Boag. 185 pp., 8vo. London: *Railway Gazette*, Queen Anne's Chambers, Westminster, 1912. Price 4s. net.

The author of this little book is at present Assistant Manager of the Great Southern of Spain Railway. And, as the title page tells us, he has had earlier experience on the Lancashire and Yorkshire, the Argentine Transandine, and the Southern Nigerian Railways. The text of his book shows further, not only that he is familiar with the statistical methods adopted on Continental, American and Indian railways, but also, as Mathew Arnold would have said, that he is in the habit of letting his mind play freely round the whole subject. The result is he has written a very valuable little book, and is entirely entitled to expect the fulfilment of his modest hope that it may be useful, “more especially abroad where there are no facilities for reference to libraries, or to friendly colleagues,” and also “as a text book to students attending the railway lectures which are now given at many large centres in England.” From the point of view of these two classes, neither of which generally know of, or can easily lay their hands on the literature of the subject, Mr. Boag has not hesitated to give half his entire space to a reprint of two important documents: the report of Sir Thomas Rees Price, General Manager of the South African Railways, to the International Railway Congress at Berne in 1910; and the Railway Companies (Accounts and Returns) Act, 1911, with the new statutory forms of accounts and statistics appended thereto. And he supplements his reprint of this Act with the schedules proposed by those members of the Board of Trade Departmental Committee on Railway Accounts who endeavoured unsuccessfully to include returns of ton mileage,

and other figures naturally derivable therefrom, among the statutory forms.

Mr. Boag's view on what he calls "the eternal ton-mile question" is quite definite. Not only does he point out that its use is universal outside the British Isles, but he says that "ton mileage is undoubtedly the most comprehensive unit that can be adopted; it is indeed the only index which can be truly said to cover in one single figure the summarised result of the actual work of transport." Further, he emphasises the fact, "often overlooked by railway officers," that many other groups of statistics, admittedly of value, depend for their production on the previous production of ton-mile statistics; and calls attention to a modern M. Jourdain in the shape of an Indian railway official, who, having been called before the Board of Trade Committee like Balaam to curse ton-mile statistics, admitted that he had been using them unwittingly all his life, because (1) he relied on train-load and waggon-load figures as a check upon the efficiency of his staff, and (2) these statistics were only obtainable as a deduction from previously ascertained ton-mile figures!

But, though Mr. Boag's own opinion is perfectly clear, he yet is careful to avoid making the weaker brethren to offend, and, accordingly, he points out quite fairly that passenger-mile figures, though nominally in *pari materie* with ton-mile figures, are by no means so valuable in actual practice, as they tend to point out to the operating official economies which from an operating point of view ought to be made, but which the powers above him, for non-economic, social, political, or it may be, strategic reasons, will certainly refuse to make. Further, he devotes a considerable amount of space to a discussion of statistical units, such as train miles per engine hour, yard costs per wagon, and the like, which are available for "disciplining the property," as an American author puts it, even where no record of ton-mileage is kept.

Mr. Boag devotes some space to a description of the actual methods employed by various administrations in working out their average figures. The practical railway man will, perhaps, wish that he had elaborated this matter more fully. On the vexed question of apportionment of costs between different branches of service his views are, we think, quite sound, namely, that an apportionment partly on the basis of estimate remains estimate and not fact; but that it still is capable of giving valuable information in comparisons, not by outsiders but by experts, and not as between, say, Argentina and Great Britain, but as between the same, or closely similar systems over a series of years.

Lastly, Mr. Boag draws attention to a point which, in the interest of those who have to use comparative statistics, cannot be over-emphasised. On page 63 he sets side by side the traffic abstracts from the accounts of two English railway companies working railways abroad. Out of eleven items of expenditure only four are charged by both companies in the same way. Our English railway companies will begin on January 1 next to keep their returns according to the new statutory forms. A Committee

of Accountants has, it is understood, been appointed by the companies to see that similar items of expenditure and receipt are entered by all the companies under the same heads. So far, so good. But, unless we go further, and the Board of Trade assume over this voluntary Committee the same supervision which the Interstate Commerce Commission in America, for instance, has over the Association of Railway Accounting Officers, it would seem that the public have no security that the information furnished in the new returns will be precisely that which Parliament intended to prescribe.

W.M.A.

6.—*The industrial Panjab: a survey of facts, conditions, and possibilities.* By A. Latifi, of the Indian Civil Service. xxvii + 304 pp., 8vo. London: Longmans, Green, and Co., 1911. Price 4s. 6d.

This work, as is indicated by its sub-title, goes far beyond the description of existing facts to which an industrial survey is too often restricted. For this part of his undertaking the author acquired the necessary qualification by personal investigation and by taking into council, workers, capitalists and those actually engaged in the manufacture or distribution of the products of which he treats. From the wide field of information thus obtained he has gathered indications of strength or weakness in the industrial position of each product, and bases upon them his suggestions for improvement or development. In the latter task he adds to the interest of the subject by enlisting into his service the results of careful study of the procedure and experience of foreign countries in regard to industries more or less corresponding to those of the Indian Province with which he is immediately concerned. As he lays considerable stress in his recommendations upon the advantages of State action, he naturally relies for many of his illustrations upon the examples afforded by Japan, on a large scale, and the Kingdom of Württemberg, upon a smaller and more intensive system.

In the main outlines, the industries of the Panjab are fairly typical of those of other parts of India. In detail, no doubt, and especially with regard to the means whereby such industries may be efficiently developed, each province presents material differences, attributable to the nature and supply of raw material, the local caste system, and the relative accessibility of large markets. The problem, however, as a whole, is very much the same throughout the country. On the one hand lies the preponderating attraction of agriculture, itself in sore need of scientific development; on the other, the vast amount of raw material at hand, but lying wasted or half-used under present conditions, and liable to get more and more neglected under the keener competition of the foreign manufacturer and the pushing enterprise of the native middleman of the seaports. The author, judiciously, touches but lightly upon the larger, or factorial, industry, dependent as it is on a labour supply at present scarce and inefficient, and upon capital, which is still more coy in entangling itself in such enterprise. He devotes the greater part of his attention to manufacture on a more modest scale, in many cases of the "cottage" order, into which he enters in

full detail, even to the cost of the modern plant required to bring the industry up to date, and the means and cost of working it. In this direction there have been already many failures, due, to some extent, to inherent defects in methods or management, which the author duly indicates; but there seems reason to think that they are partly attributable, also, to insufficient "ground-baiting" of the local market, and "drumming" in the more distant cities. On the other hand, instances of signal success are cited, where the public taste was accurately ganged, and a want, having been created, was promptly met, as the author has undoubtedly met the want of adequate information upon the important questions he has raised in a practical and interesting way. J.A.B.

7.—*Elementary principles of economics*. By Professor Irving Fisher. xxviii + 531 pp., 8vo. New York: The Macmillan Co., 1912. Price 8s. 6d.

There is no perfect text-book and there probably never will be. The value of a text-book depends upon the teacher and the students and their needs. Whether this elementary treatise will be a success or not, time alone will show. It is novel in form and highly interesting. As is to be expected, the subjects upon which Professor Irving Fisher has done such notable work receive a great deal of attention. Nearly half the book is devoted to the wealth concept, capital and income, and money and its relation to prices. The method of the book, generally speaking, is the inverse. Things are taken as they are and then explained by a step by step inquiry backwards. As regards the settlement of price, for instance, market demand and supply curves are treated first and then reduced to their constituents, so that "desirability" is not reached before page 281. The opposing method would be to begin with desirability and advance to market prices. Each method has its advantages. It is worthy of notice that on the subject of "desirability" (the name given to what is usually called utility) Professor Irving Fisher keeps clear of the trap of Utilitarianism in any form. Things are desired, and some more intensely than others—this is his foundational proposition. Into the psychological problems behind demand he is never rash enough to penetrate. And, despite unavoidable ambiguities here and there and the fact that attention is not specifically drawn to the point, he does not so treat of desirability (as some writers have done) that the student is forced to frame an erroneous atomistic conception instead of thinking of it as reached by a differentiation of experience as a whole. But, while this matter is before us, the question may be raised as to whether desirability can be measured as between different people (p. 301). The reviewer's opinion is that it cannot, and that all we can compare are the results of different people's money measurement of the desirability of things to them.

Of details to be noted the treatment of supply is perhaps the most important. The case of increasing returns in a business is allowed for and certain interesting points connected with this case are brought out. But the case is very rare, if marginal cost is

supposed to be reached by partial differentiation (so that it means the addition to total cost entailed by the production of the last unit, *other circumstances in the industry being taken as constant*); and if not, complete differentiation on the contrary being implied (so that the qualifying clause in italics is dropped), it is not easy to see how a business subject to increasing returns, interpreted on this reading of marginal cost, can be regarded as necessarily in an unstable position, as it is regarded by the author. A private cost curve obtained by complete differentiation can only be drawn, so to speak, after the event. May we not assume that it is seldom, if ever, anticipated; and that what commonly, or invariably, expresses the knowledge in the light of which employers govern their actions is the cost curve recording partial differentiations, or, in other words, marginal costs in the firm for different outputs when the other circumstances of the industry remain constant? Is it not this which, normally at least, represents determining conditions, and so settles stability? Let us call it the private determining cost curve, and allow that the private determining supply prices derived from it are obtained by averaging if it descends, as the author points out. There is a fear lest the student who has followed Professor Irving Fisher's argument should take for granted that market supply prices descend when private determining supply prices descend and ascend when private determining supply prices ascend. "The total supply curve, analogously to the total demand curve, may be derived from a number of individual supply curves" (p. 308). But normally, in the case of an industry subject to increasing returns, the total supply curve would descend while each individual determining one would ascend about the point of the firm's equilibrium. A preliminary analysis of cost variations in a business with its size would have prevented any false conclusions; for it would probably have revealed that normally the private determining cost curve falls and then rises with output, equilibrium tending to be reached where price and marginal cost are equal. But a point of seeming divergence in theory must not be pressed on the ground of what is said in an elementary book. What is said can seldom be the full truth, and the only material point in dispute may be as to what it is wise to leave out in instructing the novice. Knowledge cannot come to him complete like a fully armed Athene from the head of Zeus. But for the enlightenment of economists at least—which, however, is not the prime object of the book—some further discussion would be needed. With reference to the marginal producer, the truth of the statement that when the (private) "supply curve ascends, the seller is willing at any given price to supply a given amount *or less*" may be doubted. Surely, in most cases the marginal producer could not continuously supply less at the price because in that event he would be left with insufficient earnings to make it worth his while to continue producing, in the long run.

Coming to distribution, which is not entered into at any considerable length, it is observable that rent is used broadly of payments on account of capital, widely interpreted; so that the

Marshall concept of rent as a payment for differential advantages is discarded. But our author could find traditional support for his use of the term; and there is convenience in being able to speak of a class of *rentiers*. Earnings of employers, which are put with wages, are brought into relation with the supply price of employers, but the way in which they originate is not completely expounded—and indeed its exposition in an elementary manner may be unattainable. The treatise contains 48 diagrams which are clearly explained, and many experienced people will find themselves fully in accord with the author's view that diagrams can be largely used with success in teaching and that "the difficulties in the elementary use of curves are largely imaginary." Every new text-book into which much thought has been put is to be welcomed; and this one is packed with thought and is lucidly written. The writer of this notice is painfully aware that he has yielded to the reviewer's besetting temptation to confine himself mainly to criticism. His only excuse is that stimulating books are always provocative of discussion.

S.J.C.

8.—*An introduction to the history of life assurance.* By A. Fingland Jack, M. Com. xii + 263 pp., 8vo. London: P. S. King and Son, 1912. Price 7s. 6d. net.

The research scholarships founded in provincial Universities are producing excellent results. Mr. Jack, now of Trinity College, Cambridge, was formerly Gartside Scholar at Manchester, and has devoted much time and care to the study of his chosen subject. It must be observed, however, that the title of his work, while accurately defining the limitations he has imposed upon himself, will not give the reader an idea of what the book really does contain. The expression "Life Assurance" has acquired a distinctive meaning, applying to such contracts as enable a man to provide for his dependants against any loss they would suffer by his early death or enable a creditor or other person having an interest in the life assured to provide against the loss he would suffer in the event of the failure of that life. The mere provision for the expenses of burial, either in kind or by the payment of a small sum to defray them, in the manner practised by the mediæval gilds and modern friendly and industrial assurance societies, would be more aptly termed burial insurance.

Eleven out of the twenty chapters of Mr. Jack's book are occupied with a description of the gild system, beginning with the Roman "*collegia*" and tracing the history of the various kinds of gilds, concluding with a summary of the relief they provided. This relief took the general form of assistance to members in distress, and the provision for religious observances and other service on an occasion of death was an incidental part of it, as, indeed, all the provisions for relief were only incidental to other purposes which the gilds had primarily in view. Mr. Jack discusses this interesting subject with a thoroughness of research and a clarity of thought that deserve great commendation, but we cannot do otherwise than wonder why he should call it an introduction to

the history of Life Assurance. As a treatise on the gild system it is excellent, and if it had been given that title, it might well have attracted more readers than would be drawn to it under its present title. It is true that the last chapter in the book deals with the coming of the great companies, but it opens with the words "the modern era of life assurance hardly concerns us here." Other chapters discuss montes, corodies and State tontines as having had their share, greater or smaller, in the building up of the insurance fabric; but these have all passed away. The friendly societies are with us still: whether they, too, will some day be lost, is also a matter which Mr. Jack thinks need not greatly concern us. He opines that the rapid growth of industrial insurance might possibly give us reason to imagine they will. We do not think they are in much danger from this cause, for industrial assurance companies have hitherto been unable to deal profitably with the insurance of sick pay, which has until now been the primary business of friendly societies. Those societies stand, we think, in more danger from the operation of the National Insurance Act, and the relentless bureaucracy established under it, which will quickly strangle out of existence the voluntary element. All these considerations, however, relate to burial insurance only, and not to life insurance in its more extended sense. It is curious to observe, on the other hand, that the names of some large and prosperous life assurance companies indicate a friendly society idea in their origin—e.g., the Amicable Society and the Scottish Widows' Fund. Other chapters in this instructive and interesting book deal with usury, but this again has only an indirect relation with insurance.

Mr. Jack appends a list of works referred to in his notes, and as this contains about 200 items, it illustrates the thoroughness of his work, and forms a useful bibliography. We do not find in it, however, any reference to the curious volume of *Mémoires pour servir à l'histoire des assurances sur la vie et des rentes viagères aux Pays-Bas*, prepared by the General Assurance Society at Amsterdam and presented to the members of the London congress of actuaries in 1891. If this has not come under Mr. Jack's attention, he will thank us for introducing him to it when he is called upon to prepare a second edition of his work, for it contains not only bibliographies of the precursors and promoters of life insurance, but a number of quaint and amusing documents relating to the grant of life annuities in the thirteenth century as well as in later times, and to the manner in which the municipal authorities exercised their functions in these respects.

E.B.

9.—*Die deutschen Techniker: ihre Lebens-, Ausbildungs- und Arbeitsverhältnisse*. Von Dr. Adolf Günther. Vol. I, Tabellenband, pp. vi, 76; Vol. II, Textband, pp. vi, 244, 8vo. Leipzig: Duncker und Humblot, 1912. Price 12 marks.

The term "Techniker," so popular in Germany, does not lend itself readily to translation. It appears, however, to be applied to persons engaged in any branch of industry (whether independently or in the employ of others) who have received some limited amount of systematic technical instruction, and who possess in the industrial

organisation a status, though they do not necessarily receive a remuneration, higher than that of the ordinary skilled workman, and of course do not belong to a trade union in the ordinary sense of the term. The "Deutscher Techniker Verband," which has some thirty thousand members drawn from this somewhat indefinite class, has had the enterprise and enthusiasm to carry out a very elaborate investigation into the social and economic condition of its members, in the hope, apparently, that it would be able to find thereby a sound basis for efforts to improve the position of the rapidly growing, but scattered and inchoate, class which it is endeavouring to organise and represent over against the employers.

The Verband issued very elaborate forms, and was fortunate in receiving more or less complete returns from about 11,500 members. The results of the analysis of these returns is set out in the volumes before us. The first volume consists solely of statistical tables relating to salaries and income, hours of labour, ages, marriage and size of family, in various geographical and other groupings and combinations; the second volume is devoted to a critical summary of these tables and to the presentation of other results of the enquiry, with regard to such matters as social origin, education and cost thereof, terms of employment (frequency and extent of bonuses and other "gratifications," holidays, payment of salary during sickness or absence for military training), and extent of unemployment. As a rule, the returns are dealt with by groups, according as they relate to "Techniker" engaged in the building trades, in other industries, in the service of the Empire or States and included in the "Beamten" class, in similar employ but not in the "Beamten" class, and in two similar groups in the service of local authorities. The state or local "Beamten" represent naturally only a small proportion of the total number of persons covered by the survey, less than one-tenth; whilst "Techniker" engaged in the private building trades (*i.e.*, not employed upon State or municipal construction work) represent about one-quarter of the total. The social and economic position of the members who furnished information is perhaps sufficiently indicated by the facts that of the "Techniker," not their own masters, in the building trades, two-thirds had not attended anything beyond an elementary or at most a "higher-grade" school, whilst even in the case of the state and municipal "Beamten" the same was true of one-half the number, though, of course, in all cases there was attendance at trade schools of various kinds; that 40 per cent. had learnt their trade as bricklayers, nearly 17 per cent. as carpenters, and about 23 per cent. as fitters, erectors, &c., in engineering works; and that of the "Techniker" in the building trades in private employment, 46 per cent. were in receipt of incomes under 2,000 marks (100*l.*) per annum, while a further 36 per cent. did not exceed 3,000 marks (150*l.*)—the proportions in the case of the "Techniker" in other industries being 37 per cent. in each of the same two income groups.

In the preface we are told that a number of important problems, for which the inquiry yielded abundant material, could not be dealt with, owing to insufficient funds; but even so a remarkable piece

of social investigation has been accomplished. The Verband is to be congratulated on its energy and enterprise, and Dr. Günther on the material placed at his disposal and the use made of it. We could wish that the investigation had been extended from the income to the expenditure of the members, at least in its broad outlines; though we recognise the difficulty of such an undertaking, the nature and extent of the response to the Verband's inquiries lead us to believe that an addition to the forms for that purpose would have yielded valuable results. Apart from this, our only criticism is that the tables and commentary are so elaborate, Dr. Günther's investigations are so thorough, his ingenuity in combining groups of data so great, and his scientific caution in formulating results so pronounced, that it is very difficult (perhaps properly so) for the reader to disentangle any definite conclusions; and we have some doubt whether this report, valuable as it is to the student, will be of much use to the leaders or members of the Verband unless the results are presented to them in some more popular form.

P.A.

10.—*Deutschlands Kulturausgaben*. Von Dr. Ludwig Sevin. 183 pp., 8vo. Berlin: Puttkammer und Muhlbrecht. 1912. Price 3 mks. 60 pf.

It was to be expected that students of administration and finance would soon begin to quarry in the great mass of material which the Imperial German Government collected in 1908 and published during the discussion on financial reform. That material was hastily gathered, to a large extent ill-digested, and open (especially in respect of local finance) to much criticism; but an attempt was made, for the first time, to gather for the German Empire some comprehensive financial statistics prepared on uniform lines. If the effort was not entirely successful, the fault lay less with the Imperial Government than with the State authorities, who had hitherto in the main shown themselves curiously neglectful of the statistics of local government; and it at least brought together a large amount of data which could be of substantial value if cautiously used.

It has proved so in the hands of Dr. Sevin, who has been privileged to go beyond the published documents to the original returns received by the Imperial Treasury, and so to produce a useful and suggestive study of the expenditure of Germany upon educational (in the widest sense of that adjective) and ecclesiastical services, and of the resultant burdens upon the Empire, the separate States and the local bodies. As he uses the special material indicated above, Dr. Sevin's figures do not come beyond 1908, but nothing has occurred since then to modify the conclusions reached.

The imperial expenditure on these services is small, less than 20 million marks, the greater part being for naval and military academies, and the rest chiefly for army chaplains and churches and German schools abroad. The expenditure by the State Governments amounted to approximately 380 million marks, and represented in 1908 and the two preceding years about 23 per cent. of their expenditure on internal administration. Taxation per head in respect of these charges was highest in Anhalt, with a little over

14 marks, and lowest in Baden, with 8·2 marks. Included in these figures is State taxation for ecclesiastical purposes, which ranged from 2·1 marks in the Reichsland to nothing in Bremen, the only state in the German Empire which makes no contribution to any religious bodies. The larger part of the charge for the services under consideration falls, however, upon the local government authorities or upon the special school associations; thus, taking the combined total ordinary expenditure for 1907-8 at an estimated amount of 965 million marks, the contribution of the Imperial Government was 18 millions, of the State Governments 380 millions, and of the local authorities 567 millions, or 59 per cent. This, however, does not represent the full extent of the communal share, since it excludes the cost of new school buildings, estimated at about 10 per cent. additional to the total stated above, and falling mainly on the communes. Substantially, therefore, two-thirds of the cost of educational and ecclesiastical services—so far as met out of National funds—is borne by the communes (the higher local authorities spend an amount which is relatively insignificant). The total German expenditure by all authorities for these purposes was 17·2 marks per head of population in 1907, as compared with 17·9 marks for the Army and Navy—the comparison would hardly be so favourable now. The expenditure per child in the elementary schools ranged from 88 marks in Hamburg to 35 marks in Schaumburg-Lippe.

The burden presses very heavily upon the poorer states and areas. Whilst for Prussia as a whole the expenditure upon schools is approximately one and a half times the yield of the state income tax, it is in the eastern portions of the kingdom generally two to three times the yield of that tax for the corresponding districts, and rises in some districts to four or five times. Between the various communes there is the same disparity, and even so the relatively heavier burdens of the less prosperous districts do not enable them to attain to the same level of efficiency as their more fortunate neighbours. One remedy, if only partial, would appear to lie in the formation of large areas, with the resultant equalisation of taxation and improvement of educational administration; but this, though advantageous within the larger states, would not help the smaller ones, and Dr. Sevin's own special proposal, the taking over of education by the Empire, would, we imagine, encounter strong opposition upon obvious political grounds.

Dr. Sevin's book would be more useful to English students if prefaced by a brief outline sketch of the general educational organisation of the Empire; the absence of such a statement, though rendering his survey a little obscure in places, does not, however, seriously detract from its interest. P.A.

11.—*Problems in Eugenics. Papers communicated to the First International Eugenics Congress held at the University of London, July 24 to 30, 1912.* 486 pp., 1s. 8vo. Published by the Eugenics Education Society, 6, York Buildings, Adelphi, W.C., 1912. Price 8s. 6d. net.

In a volume entitled "Problems in Eugenics" the organising committee of the recent International Congress have collected the

papers submitted to the various sections last July. The work is not a complete record of the proceedings, because, being issued sufficiently early to render it available to members during the actual progress of the meetings, the discussions following the papers were not included; these will, we learn, be published later on. The bulk of the present volume has been greatly increased by giving translations of all papers communicated in foreign languages; a course which, if convenient to some readers, is perhaps unnecessary in the case of such international tongues as French. In view of the fact that we have not before us a complete report of the proceedings, a critical examination of the papers would be to some extent a work of supererogation, since many of the considerations which occur to the critic have probably been voiced in the discussions, and the authors may have been able to offer adequate explanations of what may appear to be fallacies in their arguments. We shall therefore confine ourselves to an enumeration of the papers which seem likely to be of special interest to Fellows of the Royal Statistical Society. To the section of Biology and Eugenics, Dr. Raymond Pearl contributed a somewhat condensed account of his work on the inheritance of fecundity in domestic fowls, and expresses the view that this highly variable physiological character is inherited in accordance with simple Mendelian principles. Dr. D. F. Weeks contributed an elaborate statistical study of the inheritance of epilepsy, the principal conclusion being that "epilepsy cannot be considered as a Mendelian factor, when considered by itself, but that epilepsy and feeble-mindedness are Mendelian factors of the recessive type, in that their germ cells lack the determiner for normality, or are nulliplex in character, while the tainted individuals, such as neurotics, criminals, sex-offenders, &c., are simplex, and the normals duplex or simplex in character" (p. 78). This paper is followed by a study of the influence of the age of parents upon the psycho-physical characters of the children, by Professor Marro. Statistics are given in this paper, but their interpretation is not very simple.

In the section of Sociology and Eugenics, M. Lucien March read a paper on the fertility of marriages according to profession and social position, which will be of interest to readers of the *Journal*. Dr. Corrado Gini's memoir, entitled "The Contributions of Demography to Eugenics" contains much important material, and we note that an extension of the paper will be published in the next volume of the Congress transactions. Dr. Hoffman's study of the maternity statistics of the State of Rhode Island is also deserving of mention.

In the section of Medicine and Eugenics, Dr. Mott's paper on "Heredity and Eugenics in Relation to Insanity" is likely to attract most attention in statistical circles. As will have been gathered from the correspondence columns of *Nature*, the validity of some of Dr. Mott's methods is a matter of controversy. Another paper contributed to this section by MM. Magnan and Fillassier, on Alcoholism and Degeneracy, makes a statistical appeal.

It is no reproach to the organisers of the Congress or to students of eugenics to remark that some of the papers in this volume display

an imperfect acquaintance with the principles of scientific method, a circumstance which accounts for the confident enunciation of irreconcilable conclusions. Thus Professor Loria roundly asserts that "the economic *élite* is not at all the product of the possession of superior qualities, but is simply the result of the blind struggle of the incomes, which brings to the top those who originally possess a larger income through reasons which may be absolutely independent of the possession of superior capacity" (p. 180). In the very next paper Professor Niceforo states (the italics are in the original): "*Men who are born with physiological and mental characters of an inferior order tend to sink into the inferior classes or tend to remain at a low level if born there. Vice versa, men who are born owning superior characters tend to elevate themselves, or to remain in the high economic, social, and intellectual positions which they already occupy*" (p. 193). It will be interesting to see whether the discussion on Professor Loria's paper was contributed to by Professor Niceforo, and if Professor Loria commented on Professor Niceforo's position.

It may at least be said with confidence that this volume is of great value to those who desire to acquaint themselves with the present attitude of eugenists towards social problems, and that a comparison of it with the records of succeeding years will be very instructive. M.G.

12.—Other New Publications.*

Andras (H. W.). Insurance Guide and Hand-Book. Fifth Edition in Two Volumes and Supplement. Vol. 1.—Life Assurance. Vol. 2.—Fire Insurance. Supplement: Historical Review of Life Assurance in Great Britain and Ireland. 3 vols., 8vo. London: C. and E. Layton, 1912. Price 10s. net.

[This work now extends to three volumes, and in revising it the compilers have considerably added to its scope. The third volume is a historical review of life assurance in the United Kingdom, and is issued as a supplement to the first volumes. The history is divided into seven periods, and contains a chronological list of life offices, beginning with 1699.]

Aupetit (A.), Brocard (L.), Armagnac (J.), Delumotte (G.), Aubert (G.). Les grands marchés financiers. France (Paris et Province). Londres, Berlin, New York. 363 pp., 8vo. Paris: F. Alcan, 1912. Price 3 fr. 50 c.

[This book consists of a series of lectures, delivered under the auspices of the Free School of Political Science. The lectures deal with the Money Market of Paris, and the French provincial money markets, as well as with the money markets of England, Germany, and the United States.]

Barker (J. Ellis). Modern Germany. Her political and economic problems, her foreign and domestic policy, her ambitions, and the causes of her successes and of her failures. Fourth edition. viii + 764 pp., 8vo. London: Smith, Elder and Co., 1912. Price 10s. 6d. net.

[The present edition is practically a new book. Seven chapters dealing among other subjects with Germany's recent foreign policy and her industrial conditions have been added, and the book describes more definitely "the points in which Germany fails." In the interesting chapters on German labour and industrial conditions, the author criticises certain of the figures given in the Board of Trade report on cost of living in German towns.]

* See also "Additions to the Library," page 150, *sqq.*

Bernstein (E.). Ferdinand Lassalle. *Le Réformateur social.* Traduit par Victor Dave. (Systèmes et Faits Sociaux.) 228 pp., 8vo. Paris: Marcel Riviere and Co., 1912. Price 5 francs.

[A study of Lassalle and of his influence in Germany and elsewhere as a social reformer.]

Beveridge (W. H.). Unemployment. A Problem of Industry. 3rd edition. xv + 405 pp., 8vo. Longmans and Co., 1912. Price 9s. net.

[The passing of the Labour Exchanges Act, 1909, and the National Insurance Act, 1911, have radically altered the treatment of unemployment in this country since Mr. Beveridge first issued his book. The most important of the relevant public documents have therefore been included in this new edition as appendices. No revision of the book itself has been attempted.]

Butler (Elizabeth B.). Russell Sage Foundation. Saleswomen in mercantile stores, Baltimore, 1909. xv + 217 pp., 8vo. New York: Charities Publication Committee, 1912. Price \$1.

[An inquiry into the earnings, hours of work and the general social and economic conditions of women and young persons employed in shops in Baltimore.]

Castle (William), Coulter (John), Davenport (Charles), East (Edward), Tower (William L.). Heredity and Eugenics. Lectures summarising recent advances in knowledge in variation, heredity, and evolution, and its relation to plant, animal, and human improvement and welfare. vii + 315 pp., 8vo. The Cambridge University Press, 1912. Price 10s. net.

[A series of public lectures given at the University of Chicago showing the recent developments of knowledge in regard to variation, heredity and evolution, and their application to plant, animal, and human development and improvement.]

Depitve (Edgard). La Toile peinte en France au xvii^e et au xviii^e siècles. Industrie. Commerce. Prohibitions. (Bibliothèque d'Histoire Économique.) xvii + 271 pp., 8vo. Paris: Marcel Riviere and Co., 1912.

[An historical review of the industry and commerce in printed calicoes and its prohibition in France in the seventeenth and eighteenth centuries, when this industry caused as much controversy as the corn trade and was the subject of numerous State ordinances, regulating the manufacture of those goods in France and their importation from India and other countries. An abundant literature dealing with the controversy came into existence and some of the best known economists contributed to it.]

Haskin (Frederic J.). The American Government. xvii + 398 pp., 8vo. Philadelphia and London: The J. B. Lippincott Co., 1912. Price 4s. 6d. net.

[A comprehensive review of the work of the Federal Government of the United States, with chapters dealing with each Government Department, giving their history, and describing their present activities and their relation to other Government Departments. These chapters have been read over and approved by the chiefs of the Departments concerned, beginning with Mr. Taft, who read the chapter dealing with the President. There are interesting details as regards the Census Bureau and the working of its tabulating machines, the Department of Agriculture and the Panama Canal. As regards the Pension Office, it may be remarked that there were still more than 350 widows of the war of 1812 on the pension rolls in 1911.]

Huskinson (Thomas W.). The Bank of England's Charters. The cause of our social distress. ix + 140 pp., 8vo. London: P. S. King and Son, 1912. Price 2s. 6d. net.

[The author's object is to convince the public that the monetary circulation of this country is not based on its standard of value as is generally supposed, but is—as a consequence of statute—based on the Bank of England note, a large portion of which rests on fiduciary security and not on bullion. If the error of the Bank Charter were amended he believes relief would be immediate and the poverty of a class would soon disappear.]

Marr (Vivyan). A Card System for Friendly Societies' Accounts and Statistics. 46 pp., 8vo. Gee and Co., 1908. Price 1s. net.

[A Paper by Mr. Vivyan Marr read before an Accountant's Society in Glasgow. The basis of the system is a card register, one for each member, on which details are given as to his age, occupation, contributions paid, and benefits for sickness received. It is in the sickness data that the greatest advantage would be reaped from the use of cards, the detailed scheme of which is explained in the paper.]

Pissargersky (Mlle. Lydie de). Note sur les Recensements de divers pays. 24 pp., 8vo. Nancy, 1912.

[A useful compilation of the population of different countries by age, sex, civil condition and occupation with reference to the Feminist movement. The work is illustrated by diagrams and charts.]

Samuels (Arthur Warren). Home Rule Finance. An examination of the Financial bearings of the Government of Ireland Bill, 1912, with foreword by the Rt. Hon. Sir Edward Carson, M.P. 334 pp., 8vo. Dublin: Simpkin, Marshall and Co., 1912. Price 1s. net.

[Limited to a consideration from the Unionist point of view of some of the financial aspects of the Home Rule Bill of 1912.]

Simrel (Rudolph). Statistische Übersichten zur Wirtschafts- und Verkehrskunde. 143 pp., 8vo. Wien: Alfred Hölder, 1912.

[A useful compilation in two parts, the first consisting of general statistics of the principal countries, arranged somewhat in the style of Häbner's Statistical Tables, and the second of recent statistical data as to production, consumption and trade of various commodities, with other information arranged in alphabetical order on the lines of Webb's "Dictionary of Statistics."]

Stieckloff (Georges). La Fraction Social-Démocrate dans la troisième Douma. 88 pp., 8vo. Paris: M. Rivière and Co., 1913.

[An account of the formation and objects of the Social Democratic Party in the Russian Duma.]

Taris (Etienne). La Russie et ses Richesses. 252 pp., sm. 8vo. Paris: Pierre Roger and Co., 1912. Price 4 francs.

[A general survey of the Russian Empire, and of economic and social conditions there prevailing. The author briefly describes the history of the relations between France and Russia, the investments of French capital in Russian industrial and other undertakings, and deplors the apathy of the French people in not further visiting the country and securing more of its trade.]

Wandervelle (E.). La Coopération neutre et la Coopération socialiste. 226 pp., 8vo. Paris: Felix Alcan, 1913. Price 3 fr. 50 c.

[This book is a history of the relations between socialism and co-operation from the beginning of the movement under Robert Owen to 1910. The author divides his book into three chapters, describing, first, what these relations were; secondly, what they are now; and thirdly, what they should be. The author shows that co-operation was really socialistic in its origin, that it became gradually estranged from socialism to the degree of being actually opposed to it, but that in recent years this opposition has gradually passed away, and that both systems are tending to unite again in their objects and activities.]

Walsh (Robert). The Principles of Industrial Economy illustrated by an Enquiry into the comparative benefits conferred on the State and on the Community by Free Trade and Fair Trade on Moderate Protection. xiv + 257 pp., 8vo. London: P. S. King and Son, 1912. Price 6s. net.

[The author in this book, which is opposed to Free Trade, considers the relationship of the elementary principles of industry, occupation and service, and brings to his task a knowledge of the internal working of production and commerce acquired by many years of professional experience in various industries. There are a series of comprehensive tables of the cost of production and distribution of British goods.]

Walter (A.). Studies in Mauritian Statistics. Being discussions of certain social and economic problems, either arising out of or intimately dependent on the Census Enumeration of March 31, 1911. 1. Agricultural Labour. Fol. 1912.

[A study of the social and economic condition of agricultural labourers in Mauritius. These are almost entirely attached to the sugar industry, which has much developed during the past twenty years.]

Wolff (Henry W.). Co-operation in agriculture. 378 pp., 8vo. London: P. S. King and Son, 1912. Price 6s. net.

[Gives a general outline of what has been accomplished by the application of co-operative methods to agriculture in different countries. The movement has been somewhat backward in England, but the coming into force of the Small Holdings Act has brought the question to the front, and the book, besides stating what has been done already, offers suggestions for its adoption as occasion may require.]

Seasonal Trades, by various writers, with an introduction by Sidney Webb. Edited by Sidney Webb, LL.B., and Arnold Freeman, M.A. x + 410 pp., 8vo. London: Constable and Co., 1912. Price 7s. 6d. net.

[This volume consists of a series of articles by different authors dealing with the various trades which are mostly affected by regular periods of slackness. The degrees and causes of this recurrent depression in the different trades are examined, and remedies which might remove or mitigate the evil are considered.]

Concentration des Entreprises industrielles et commerciales. By A. Fontaine, L. March, P. De Rousiers, F. Samazeuilh, A. Sayous, G. Veillat, P. Weiss. 270 pp., sm. 8vo. Paris: Felix Alcan, 1913. Price 3 fr. 50 c.

[A collection of lectures delivered at the École des Hautes Études Sociales. The subjects discussed include: Concentrations in Manufacturing Industries, Private Banks, Export and Colonial Trade, Concentration in Retail Trade and in Shipping and the Extractive Mineral Industries. M. Arthur Fontaine contributes an introduction of a general character, though dealing specially with the rôle of the *entrepreneur* in modern large and small industries, as shown in the recent industrial censuses of France, Germany and the United States.]

Year-Book of Social Progress for 1912. Summary of recent legislation, official reports, and voluntary effort, with regard to welfare of the people. viii + 617 pp., sm. 8vo. London: T. Nelson and Sons, 1912. Price 2s. net.

[This book consists of some thirty articles, some of them signed, dealing with different phrases of social reform. Each article is followed by a short bibliography. An index in later editions would add to the value of the book as a work of ready reference.]

France. *Liste des Victimes du Tribunal Révolutionnaire à Paris.* 194 pp., 8vo. Paris: Picard et Fils, 1911. Price 5 frs.

[A return, compiled from copies of the certificates of death, of the numbers of persons executed in Paris from the beginning of 1793 to June, 1795. The original documents were destroyed during the Commune in 1871, and the list is admittedly incomplete. It is, however, an interesting record of the deaths of some 2,800 persons, and gives in nearly every case their names, Christian names, age, occupation, and place of birth. The names are arranged in the chronological order of the execution of the victims, Louis XVI being the first on the list (Jan. 21, 1793), and his son, the Dauphin, coming last (June 8, 1795, the date of his death in the Temple). Copies of their full certificates of death are also given. There is a table of the daily number of executions. These reached their highest number (70) on July 29, 1794, the victims being nearly in all cases persons in humble life. An alphabetical list of those executed completes the work.]

Hungary. *Statistisches Jahrbuch der Ungarischen Städte.* Herausgegeben vom Landeskongress der Ungarischen Städte. Redigiert von Prof. Dr. Gustav Thirring. 1. Jahrgang. La. 8vo. Budapest, 1912. Price 20 kronen.

[The volume is in Hungarian, though a translation in German of the contents and of the headings of the tables is given at the beginning of the volume. Information of a nature usual to works of this kind is given of some 138 towns, and it is grouped under 18 heads, among which may be mentioned, meteorology, areas and population, public health, poor relief, trade and traffic and municipal finance. In addition the work is preceded by a short description of each of the towns with which the book deals and a list of their officers. The plan of the book is conceived on somewhat different lines to that of the Austrian Year-book of Towns issued by the Statistical Central Commission, Vienna, thirteen volumes of which have now been published.]

CURRENT NOTES.

The trade returns again show a large increase. The sub-joined tables compare the returns of the twelve months ending November, 1912, with the twelve months ending November, 1911.

[000's omitted.]

Imports.	Twelve months ending November, 1912.	Twelve months ending November, 1911.	Increase (+) or decrease (-).
Imports, value c.i.f.—	£	£	£
I. Food, drink and tobacco	263,448,	261,594,	+ 1,854,
II. Raw materials and articles mainly unmanufactured	252,836,	257,881,	- 5,045,
III. Articles wholly or mainly manufactured	167,327,	157,532,	+ 9,795,
IV. Miscellaneous and unclassi- fied (including parcel post)	2,549,	2,555,	- 6,
Total merchandise	686,160,	679,562,	+ 6,598,
Imports of bullion and specie	63,533,	69,284,	- 5,751,

[000's omitted.]

Exports.	Twelve months ending November, 1912.	Twelve months ending November, 1911.	Increase (+) or decrease (-).
Exports of produce and manu- factures of the United Kingdom, value f.o.b.—	£	£	£
I. Food, drink and tobacco	29,215,	26,587,	+ 2,628,
II. Raw materials and articles mainly unmanufactured	54,582,	53,707,	+ 875,
III. Articles wholly or mainly manufactured	363,758,	345,979,	+ 17,779,
IV. Miscellaneous and unclassi- fied (including parcel post)	9,099,	8,200,	+ 899,
Exports of foreign and colonial merchandise, value f.o.b.—			
I. Food, drink and tobacco	14,396,	13,185,	+ 1,211,
II. Raw materials and articles mainly unmanufactured	61,051,	63,310,	- 2,259,
III. Articles wholly or mainly manufactured	28,919,	27,408,	+ 1,511,
IV. Miscellaneous and unclassi- fied (including parcel post)	151,	234,	- 83,
Total, British, foreign and colonial	561,174,	538,610,	+ 22,564,
Exports of bullion and specie	56,804,	66,322,	- 9,518,

[000's omitted.]

Shipping.	Twelve months ending November, 1912.	Twelve months ending November, 1911.	Increase (+).
Total, British and foreign, <i>entered</i> with cargoes	Tons 42,318,	Tons. 41,834,	Tons. + 484,
Total, British and foreign, <i>cleared</i> with cargoes	59,817,	57,799,	+ 2,018,

Mr. Sauerbeck's index-number of prices for June, as stated in the last number of this JOURNAL was 85·5. There was a rise in July to 86·5, a fall in August to 85·9, and a recovery in September to 86·7. This was followed by a fall in October to 85·8, and a further fall in November to 85·3. Taking food and materials separately, the course has been as follows :—

	June.	July.	August.	September.	October.	November.
Food	83·5	84·4	81·5	79·5	77·8	77·3
Materials	87·0	88·0	89·2	91·9	91·6	91·2

Mr. Sauerbeck states that the average index-number for the eleven months is about 85, the same as in 1881. The *Economist* number was as follows :—June, 2,705 ; July, 2,746 ; August, 2,722 ; September, 2,740 ; October, 2,722 ; November, 2,721.

According to the Board of Trade *Labour Gazette* the state of the labour market since last May has been as follows :—

	Trade Unions making returns.		Reported as unemployed.	
	Number.	Net membership.	Number.	Percentage.
June, 1912	390	833,940	20,698	2·5
May, 1912	392	836,949	22,307	2·7
June, 1911	394	758,666	22,895	3·0
July, 1912	390	863,546	22,222	2·6
June, 1912	390	833,940	20,698	2·5
July, 1911	394	769,043	22,116	2·9
August, 1912	383	872,817	19,556	2·2
July, 1912	390	863,546	22,222	2·6
August, 1911	394	769,367	25,075	3·3
September, 1912	383	877,811	18,785	2·1
August, 1912	383	872,817	19,556	2·2
September, 1911	394	779,761	22,850	2·9
October, 1912	383	885,100	17,822	2·0
September, 1912	383	877,811	18,785	2·1
October, 1911	394	792,685	21,893	2·8

Compared with a year ago, all the principal industries showed an improvement.

A return has been issued on a White Paper [339. Price, 1½*d.*], showing for every year from 1800 to 1910, inclusive, the current price of British wheat per quarter, the highest and lowest import duties charged on imported wheat, and the current price of bread in London. In the course of the return it is pointed out that the rates given for the years 1823 onwards represent the highest and lowest rates charged and the average rate paid in each year. In some cases, the averages given are below the *lowest* duty recorded as leviable. This is especially notable as regards the average duty paid on foreign wheat in the years 1833 to 1836 inclusive. In these years the quantities of foreign wheat admitted to home consumption were extremely small—less than 3,000 quarters altogether. The explanation of the discrepancies between the range of duties charged and the averages recorded as paid is probably to be found in “the postponement of entries,” and “the abatement of duty on quantities damaged.”

A supplement in continuation of the Report of the Medical Officer of the Local Government Board for 1910-11 has been issued (Cd. 6342. Price 1*s.* 7*d.*). It consists of a Report on Isolation Hospitals by Dr. H. Franklin Parsons, with an introduction by Dr. Newsholme. In the introduction it is pointed out that the inquiry into the cost of construction of isolation hospitals has been carried out by Dr. Parsons from time to time as opportunities occurred during his official connection with the Board, and has been completed by him since his retirement in 1911. The primary objects of the inquiry were to investigate the complaints received by the Board concerning the large and increasing cost of construction of isolation hospitals, and to furnish instances of satisfactory hospitals which had been erected at a reasonable cost, in order that local authorities bringing proposals before the Board, apparently too costly in character, might be referred to more economical examples of what was needed. The report may be regarded as supplementing the report “On the Use and Influence of Hospitals for Infectious Diseases” by the late Sir R. Thorne Thorne, F.R.S., which was issued by the Board in 1882, and was extremely useful in its time. This report was reprinted in 1900, with a preface giving later information up to that date. Since 1882, however, medical knowledge respecting infectious diseases has grown, and the need for considering each infectious disease as a separate problem has become more evident. In the past twenty years, the cost of isolation hospitals has increased; in part because of a greater desire for efficiency on the part of local authorities, and in part because of the increased cost of labour and of building materials.

An isolation hospital of medium size commonly varies in cost between 300*l.* and 500*l.* per bed; but 500*l.* per bed has often been exceeded. Very high prices per bed have sometimes been due to inexperience of the architect, to want of due regard to economy in design or to insufficient supervision and control over the cost of erection. More often the excessive cost has been caused by the high price paid for the site, or by the heavy expenses involved in preparing it for building. Owing to the objections commonly raised to the establishment of an isolation hospital in a locality, it often happens that a local authority finds it necessary to purchase a larger or more costly site than would otherwise be required, and to incur heavy legal expenses in meeting opposition. The site, furthermore, if in an isolated situation, may entail large expenditure in respect of water supply, drainage and other requisites, road making, cartage of materials, &c.; and due allowance for these special expenses, which are reckoned among the costs of building, is not always made when a comparison of the cost of buildings, exclusive of site, is instituted.

The report has been issued of the Commission appointed by the Government of New Zealand in May, 1912, to inquire into the cost of living in that country. The scope of the inquiry was an extensive one, and the questions considered comprised, *inter alia*, the cost of living in New Zealand as compared with other English-speaking countries, the influence of a higher standard of living, the influence of monopolies, trusts and other similar associations in raising prices, the effect of tariff reduction, the influence, if any, of the rise in the price of land, and the effect, if any, of labour legislation on the increase in prices of commodities. While regretting the paucity of statistical information relevant to the questions submitted, the Commission, in spite of the difficulty of disentangling and measuring the effects of special causes of the rise in the cost of living, were able to group certain of the causes in the order of their importance. The chief of those is stated to be the increased supply of money, including gold and credit, and the increased velocity of circulation, all of which appears to have outstripped the increase in the volume of goods and services exchanged against them. The second cause is found in the increased cost of production of farm products, and the increased demand, both locally and abroad, for foodstuffs produced in the country; while the third is rural depopulation abroad and the slackened rate of production of foodstuffs in countries such as the United States, which have hitherto exported a large proportion of the amount produced therein. Fourth in the order of importance is the effect of local monopolies, combinations and trusts

in raising prices directly to the consumer and tending to discourage initiative and self-reliance. Other contributory factors are adduced under eight heads, but no attempt is made to assign their relative importance: they include such matters as the diminishing natural fertility of the soil, increased taxation, the operation of protective tariffs and trusts abroad, education and the higher standard of life.

In suggesting remedies the Commission give prominence to their recommendation for the improvement of the official statistics, and urge (*a*) that the Government Statistician should have full control of statistics; (*b*) that his office should form a separate department; (*c*) that he should be allowed a period abroad for the study of statistical methods; (*d*) that an Advisory Board of Statistics should be created; (*e*) that the more responsible offices should be filled by men who have gone through a recognised course of training in statistical methods and economics; and (*f*) that the Government should offer a scholarship for post-graduate research in social economics.

It is officially announced in Pretoria that the Union Government has decided to continue the Census Office as the Department of Statistics for the Union of South Africa. The new department will carry out the census at proper times as before, but at all other times will collate statistics on all necessary subjects and report at stated intervals. The department will be under the control of Mr. Motiāt, the late Director of Census.

The first issue of a new annual publication of the International Agricultural Institute has appeared recently under the title *Annuaire International de Statistique Agricole*. The report comprises a series of tables, arranged in a systematic manner, giving the area of production of the principal crops, and the numbers of six species of live stock in the fifty countries adhering to the Institute. In addition to dealing generally with the difficulties of compiling comparative tables of areas and crops, the *Annuaire* contains several tables of index numbers, the figures for 1901 being taken as 100, which trace variations in the production of certain crops.

It is announced that the publication of the series of Annual and Special Reports and of bi-monthly Bulletins of the United States Department of Commerce and Labour, has been discontinued, and since July, 1912, a Bulletin is published at irregular intervals, each number consisting of matter devoted to one of a series of general subjects. These Bulletins are numbered consecutively in each series,

and also carry a consecutive whole number, beginning with 101. The series of Bulletins comprises wholesale prices, wages and hours of labour, women in industry, workmen's insurance and compensation and other matters falling within the province of the Department.

It is announced that the Bureau of Manufactures and the Bureau of Statistics of the United States Department of Commerce and Labour have been consolidated into one office known as the Bureau of Foreign and Domestic Commerce.

A series of articles by Professor W. J. Ashley on Gold and Prices, which appeared originally in the *Pall Mall Gazette* in March, have been reprinted in pamphlet form. In a preface Professor Ashley refers to an interesting return recently issued by the Co-operative Wholesale Society, which shows, for certain years from 1898 onward, the cost to the Society, at wholesale prices, of what it calls "an average weekly family grocery order." The order consists of 1 lb. bacon, 2 lbs. butter, $\frac{1}{2}$ lb. cheese, 12 lbs. flour, $\frac{1}{2}$ lb. lard, 1 lb. meal, 4 lbs. sugar and $\frac{1}{2}$ lb. tea. The whole series is as follows:—

	<i>d.</i>		<i>d.</i>		<i>d.</i>		<i>d.</i>
1895	53·38	1898	63·85	1908	70·21	1911	71·00
'96	59·48	1906	67·28	'10	72·38		.

Professor Ashley points out that the figures for 1911 are 19 per cent. above those for 1896; and that this tallies exactly with the estimate of the Board of Trade as to retail food prices in London. The object of the inquiry, however, is not to adduce further evidence as to the fact or the amount of the rise of prices, but to deal with the *modus operandi*—"the exact way in which under the present "conditions of trade the taking of gold out of the earth does, in "fact, touch prices." Professor Ashley argues that, making all allowance for those manufactured goods which cost no more or even less than before, the effect up to the present of the new gold supplies is a rise of 10 or 12 per cent. in the general cost of living.

The *Transactions of the Liverpool Economic and Statistical Society* for the Sessions 1910-11 and 1911-12 contain several interesting Papers. Miss Rathbone contributes a study on "The Problem of "Women's Wages" which is an inquiry into the causes of the inferiority of women's wages to men's. Several "reasons" or "causes," each representative of "a great bundle of complicated "social facts," are discussed. Miss Rathbone groups them under five heads, and after dealing with them in detail, concludes that "the difference between the wages of men and women is due to

“the different consequences which marriage has for the two sexes.” A Paper by Professor S. J. Chapman on “The Problem of Unemployment” is concerned chiefly with the influence of trade cycles. Causes of unemployment are classified as subjective and objective, the subjective causes being largely physical, mental or moral defects, and the objective causes principally trade cycles, seasonal demand and supply, certain industrial changes and the present system of casual labour. Professor Chapman discusses the effects of trade cycles, and the difficulties of lessening their effects in causing unemployment, but he is careful to point out that “the complete unemployment occasioned by trade cycles and unavoidable seasonal fluctuations is not necessarily to be regarded as an inevitable dispensation of an inscrutable providence.” He is of opinion that by organisation on the lines of labour exchanges, and by the absorption of “their own unemployed” by the various industries much might be done to prevent oscillations. Mr. F. J. Marquis’s Paper on the “Upward Mobility of Labour as evidenced in the Lancashire Cotton Industry” is a study on somewhat similar lines to that contributed to the Royal Statistical Society by Professor Chapman and Mr. Marquis early this year. A Paper by Mr. R. Williams on “The Liverpool Docks Problem” is supplemental to a Paper previously read by Miss Rathbone before the Liverpool Economic and Statistical Society, and was noticed in the JOURNAL for May, 1912.

Two articles by Professor Irving Fisher, entitled “Will the present upward trend of world prices continue?” and “A stable monetary yardstick the remedy for the rising cost of living” have been reprinted in pamphlet form from the *American Economic Review* and the *Independent* respectively. In a covering circular Professor Fisher states that while the one article shows the practical certainty of a continued high and rising cost of living, the other proposes a partial remedy. Both, he thinks, afford arguments for calling an International Conference on the Cost of Living. It is stated that a Bill to this effect has passed the Senate, and having been recommended by the House Committee on Foreign Affairs, will probably come up for consideration in December.

It is announced that the Government of Chile have recently re-organized the statistical service of the Republic, and have established a Central Bureau for the control of all branches of statistical work.

The Committee for Rural Economy of the University of Oxford have filled the Directorship of the Institute for Research in Agricultural Economics by the appointment of Mr. C. S. Orwin.

The institute has been established by co-operation between the University, the Board of Agriculture and Fisheries and the Development Commission.

By the death of Mr. A. H. Bailey, who was elected in 1855, the Society loses one of its oldest Fellows, and the Council a colleague whose services date back almost continuously to 1878. Mr. Bailey was a Vice-President in 1882 and 1883, and he was Chairman of the Library Committee until November, 1910, when, owing to ill-health, he was obliged to sever his long connection with the Council. Until that date he was most regular in his attendance at the Society's meetings, as well as at the meetings of the Council and the Library Committee. On a number of occasions he acted as one of the auditors of the Society's accounts.

Mr. D. F. Schloss, whose death occurred on October 15, joined the Society in 1891, and in 1893 contributed to its transactions his important Paper on "The Reorganisation of our Labour Department." Although not a member of the Council, his connection with the Society was intimate, and his interest in its proceedings and welfare was frequently manifested.

It is announced that the Governors of the London School of Economics and Political Science (University of London) are enabled, by a donor who prefers to remain anonymous, to offer a prize of 100*l.* for the best essay or monograph submitted by July 31, 1913, on one of the following subjects:—

1. An analysis, quantitative and qualitative, of the annual consumption of wealth in the United Kingdom, showing in what the total product of commodities and services actually consists, and how and by whom it is "consumed," and as far as concerns any part of it, with what unsatisfactory or positively deleterious results.

2. The actual working and ascertained results of the Old Age Pensions Act, with suggestions for its improvement.

3. A survey of any village or small town in Great Britain accompanied by an estimate of its characteristic advantages and its limitations, with suggestions for improvements (*a*) from within, (*b*) from without.

4. A new factory Bill, which should, without adopting any new principle, by appropriate technical clauses in Parliamentary form, extend and make applicable to every section of employed persons in the United Kingdom all the various protective provisions now applicable only to particular sections in the existing Factory, Workshops, Truck, Shop Hours, Railway and Mines Regulation, Trade

Boards, Merchant Shipping, and similar Acts; with a view to securing by law to every worker such a national minimum of education, sanitation and safety, leisure and rest, and subsistence as is already prescribed by law for some workers.

5. Whether, and if so in what manner and to what extent, the best economic use of land in Great Britain, urban or rural, is prevented by (*a*) considerations of sport or pleasure, (*b*) restrictive covenants in leases or other conditions of tenancy, (*c*) life interests, trusts and other forms of limited ownership, and (*d*) the system of assessment and rating, and other methods of taxation.

6. Whether, and if so, under what circumstances and to what extent, the agricultural industry as it is or as it might be carried on in Great Britain could afford higher wages to those engaged in it.

If suitable monographs or essays are submitted, five, or possibly more, additional prizes will be given, value 5*l.* each. The competition will be open to all, without restriction of age, sex, nationality, residence, educational qualifications or connection with any university or other institution. The monographs or essays must be in the English language and may be of any length, and it is stated that they will be judged, not so much for literary excellence or formal completeness as for originality of idea or statement, accurate presentation of duly authenticated facts, exact description of what actually exists, and definite practical suggestions of reform. The award will be made by the Director of the London School of Economics and Political Science, in consultation with the donors and with expert assessors in each subject. Any inquiries addressed to the Secretary of the London School of Economics and Political Science, Clare Market, Kingsway, London, must enclose a stamped and directed envelope.

A course of six lectures will be delivered at University College by Professor Karl Pearson, F.R.S. (Galton Professor of Eugenics), Miss Ethel M. Elderton, Dr. David Heron, and Mr. W. Palin Elderton, on Tuesday evenings at 8 p.m., beginning on February 11. They will deal with the following subjects: Heredity, Environment, and Parental Habits in their Relation to Infant Welfare; Heredity of Piebaldism and of Albinism in Man; the Relation of Fertility in Man to Social Value in the Parent; Some points with regard to our Present Knowledge of Heredity in cases of Feeble-mindedness; the Mortality of the Phthisical under Sanatorium and Tuberculin Treatments; and Recent Studies of Heredity in Dogs, and their Bearings on Heredity in Man. The course will be open to the public without fee, but application for tickets should be addressed to the Secretary of University College.

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

Bankers' Magazine, 1912—

August—The banking problem from the point of view of a layman. Being the application of the statistical method to the banking problem: *Peake (E. G.)*, B.A., LL.B.

September—The export of British capital and the decrease in value of home investments. Savings banks statistics: *Gibson (A. H.)*.

November—Savings banks statistics: *Gibson (A. H.)*.

Economic Journal. *September*, 1912—A narrative of the coal strike: *Robertson (D. H.)*. The principle of land value taxation: *Wedgwood (J. C.)*. Uncertainty in its relation to the rate of interest: *Larington (F.)*. The sensitiveness of the modern seaport: *Howe (F. A.)*. A study of Australian vital statistics: *Duckworth (A.)*. The economic future of gold: *Lehfeldt (Prof. R. A.)*. The incidence of some land taxes: *Chapman (Prof. S. J.)*. The family budget of an Indian Raiyat: *Perrott (H. R.)*.

Economic Review, 1912—

July—The landlords, the labourers, and the land: *Curtler (W. H. R.)*.

October—Agricultural labourers and a minimum wage: *Lennard (Reginald)*. Education and Economics: *Furnivall (J. S.)*.

Eugenics Review. *October*, 1912—The First International Eugenics Congress: *Schuster (Dr. Edgar)*. Infant mortality and its administrative control: *Greenwood (M., Jr.)*.

Financial Review of Reviews. 1912—

August—Russia as a field for investment: *Ruffalovich (His Excellency Arthur)*. London's tube and bus combine: *Lawson (W. R.)*.

September—The breakdown of the Board of Trade: *Wright (Arnold)*.

October—The Panama Canal and its effect on the world's trade: *Burrett (Hon. John)*. The development of Finland: *Pooley (A. M.)*.

Journal of the Institute of Actuaries, 1912—

July—Notes on the construction of mortality tables: *Elderton (W. Palin)* and *Fippard (Richard C.)*. Note on mortality on the West Coast of Africa: *Hart (J. R.)*.

October—On the superannuation and pension funds of certain Metropolitan Borough Councils, their establishment, administration, and actuarial investigation: *Manly (H. W.)* and *Ackland (T. G.)*. The medico-actuarial investigation of the mortality of American and Canadian Life Assurance Companies: *Hunter (Arthur)*.

UNITED STATES—

American Economic Review. September, 1912—Will the present upward trend of world prices continue? : *Fisher (Irving)*. The report of the Tariff Board on cotton manufactures: *Copeland (Melvin T.)*. A balanced tariff: *Wallace (Harry Brookings)*.

American Journal of Sociology. September, 1912—The infusion of socio-political ideas into the literature of German economics: *Philipporich (E.)*. The variability of the popular vote at presidential elections: *Chapin (F. Stuart)*. Chicago housing conditions. VI. The problem of the Negro: *Connstock (A. P.)*.

American Statistical Association. Quarterly Publications, 1912—

No. 98. June—Reporting of industrial accidents: *Chadlock (R. E.)*. The coal supplies and coal production of the United States: *Parker (Edward W.)*. Wages in Massachusetts and New Jersey: *Nearing (Scott)*. The degree of correspondence between two series of index-numbers: *Mayce (J. D.)*.

No. 99. September—Statistics at the Fourteenth International Congress on Hygiene and Demography, Berlin, September 23—29, 1907: *Willcox (Walter F.)*. The permanent Census Board of New York City: its present work and possibilities for development: *Chatfield (G. H.)*. The mortality of the Workmen's sick and death benefit fund of America: *Koniger (Edward H.)*.

Bulletin of the Bureau of Labor. 1912—

No. 98. January—Mediation and arbitration of railway labor disputes in the United States: *Neill (Chas. P.)*. Canadian Industrial Disputes Investigation Act of 1907. Conciliation and arbitration of railway labor disputes in Great Britain. Conciliation and arbitration in Great Britain. Attitude of employing interests toward conciliation and arbitration in Great Britain: *Low (A. Maurice)*. Attitude of labor toward conciliation and arbitration in Great Britain: *Holder (Arthur E.)*. Conciliation, arbitration, and sanitation in the cloak, suit, and shirt industry in New York City: *Winslow (Charles H.)*. Industrial courts in France, Germany, and Switzerland: *Sumner (Helen L.)*.

No. 99. March—Wholesale prices, 1890 to 1911. Wholesale prices in Canada, 1890 to 1911.

No. 100. May—List of industrial poisons and other substances injurious to health found in industrial processes.

Journal of Political Economy. November, 1912—The banking question in Congress: *Willis (H. Parker)*. What is the future of American cotton? : *Hogan (John V.)*. The movement of rural population in Illinois: *Hoagland (H. E.)*. The economic basis of the fight for the closed shop: *Lewis (Howard T.)*.

Political Science Quarterly. September, 1912—Recent tax reforms abroad. I.: *Seligman (E. R. A.)*. How Germany deals with workmen's injuries: *Baur (E. E. von)*.

UNITED STATES—*Contd.*

Quarterly Journal of Economics. August, 1912—Ricardo's Criticisms of Adam Smith: *Macdonald (Robert A.)*. A Group of Trusts and Combinations: *Stevens (W. S.)*. Henry C. Carey's attitude toward the Ricardian Theory of Rent: *Turner (John Roscoe)*. The Relation between kinds of Statistical units and the quality of Statistical Material: *Watkins (G. P.)*. Some problems in Market Distribution: *Shaw (A. W.)*. Tudor "Books of Rates." A chapter in the history of the English Customs: *Gras (N. S. B.)*.

AUSTRIA—

Statistische Monatschrift. 1912—

July—Die Parzellierung des landtäflichen Grundbesitzes in Galizien: *Brzeski (Th.)*.

August—Statistik und Rassenbiologie einschliesslich Rassenhygiene: *Žižek (Dr. Franz)*. Erste Konferenz für Landes- und Städtestatistik: *Klezl (Dr. Felix Freiherr von)*. Die Methode und Technik der österreichischen Volkszählungen: *Hecke (Dr. Wilhelm)*. Die Gesellschaften mit beschränkter Haftung im Jahre 1911: *Oberndorff (Karl Graf)*.

September—Zur Methodologie der Einkommensstatistik: *Vogel (Dr. Emanuel Hugo)*.

FRANCE—

Bulletin de la Statistique générale de la France. October, 1912—Études spéciales. L'émigration des peuples jaunes: *Bunle (Henri)*.

Bulletin de Statistique. Ministère des Finances. 1912—

July—Production des alcools en 1911 et 1910. Suisse.—L'Assurance en cas de maladie et d'accidents. (Loi du 13 juin 1911.)

August—La revision de l'évaluation des propriétés bâties pour la ville de Paris en 1909-1910. Espagne.—Le nouveau tarif douanier. (Décret royal du 27 décembre 1911.)

September—Les caisses d'épargne ordinaires en 1910. L'ensemble des opérations des caisses d'épargne pendant l'année 1910.

Bulletin du Conseil Supérieur de Statistique. No. 11. 1912—Rapport du Directeur de la Statistique générale de la France à M. le Ministre du Travail et de la prévoyance sociale. Rapport sur le dénombrement des fonctionnaires par catégories (lois de finances de 1905 et 1910): *Faure (Fernand)*. Rapport sur les conditions démographiques générales des familles de fonctionnaires: *March (Lucien)*. Rapport sur la composition des familles de fonctionnaires d'après le nombre des enfants de chaque âge: *Bertillon (Jacques)*.

Journal des Économistes. 1912—

July—Résultats généraux du Censur des États-Unis: *Guyot (Yves)*. La faillite de la politique sociale allemande: *Raffalovich (Arthur)*. Les Sociétés à forme tontinière (*continued in October, 1912, issue*): *Richard (P. J.)*. L'évolution économique de la République Argentine (*continued in August and September, 1912, issues*): *Lafond (Georges)*. Les dettes

FRANCE—*Contd.**Journal des Économistes.* 1912—*Contd.**July—Contd.*

comparées des villes de France: *Léris (Pierre)*. La loi anglaise d'assurance sociale en 1911 (*continued in September and October, 1912, issues*): *Bellom (Maurice)*.

August—La solution économique des grèves: *Guyot (Yves)*. L'influence de l'accroissement des budgets publics: *Wolff (Robert)*. L'assistance par le travail: *Nouvion (Georges de)*. Les crédits supplémentaires des chemins de fer de l'État devant le Parlement: *Macler (Ch.)*. Les pêcheries néerlandaises et la liberté commerciale: *Pierson (J.)*.

September—La valeur locative des propriétés foncières non bâties en France: *Guyot (Yves)*.

October—Le rôle économique des céréales: *Guyot (Yves)*. La Banque d'État prussienne: *Ruffalovich (Arthur)*.

November—La question d'Orient et les conflits économiques: *Guyot (Yves)*. Les caisses de conversion de la République Argentine et du Brésil: *Subercaseaux (G.)*. La politique coloniale: *Schelle (G.)*.

Journal de la Société de Statistique de Paris. 1912—

July—Les institutions d'assistance publique en Angleterre et en Allemagne: *Bernonville (Dugé de)*.

August–September—Note sur les recensements de divers pays: *Pissargersky (Mlle. Lydie de)*. La théorie des salaires (à propos de l'ouvrage du professeur Ludwell Moore, *Laws of Wages*): *March (Lucien)*. Le census de 1911 et la démographie de l'Australie: *Meuriot (Paul)*. A propos du dernier recensement belge: *Meuriot (Paul)*.

October—La population industrielle comparée de l'Empire allemand et de la France de 1895 à 1907: *Ville-Chabrolle (M. de)*. La population et les élections sénatoriales en France: *Meuriot (Paul)*.

November—Un exemple d'application de la statistique à l'assainissement des villes.—Le casier sanitaire des maisons de Paris: *Juillerat (Paul)*. Statistique démographique de la commune de Seillans (Var), de 1809 à 1908: *Raffalli (Dr.)*.

La Réforme Sociale, 1912—

July 1–16—Le rôle économique des municipalités.

August 1–16—Les habitations à bon marché: *Risler (G.)* (*continued in next issue, September 1–16, 1912*).

September 1–16—Le monopole des pompes funèbres et sa municipalisation: *Taudière (Henry)*.

October 1—L'expansion bretonne en France: *Choleau (Jean)* (*continued in next issue, October 16, 1912*).

Revue d'Economie Politique. 1912—

July–August—Les grandes régies d'État: *Pic (Paul)*. Destutt de Tracy: *Allix (Edgard)*. Hausses et baisses générales des prix: *Lescure (Jean)*. Chronique des transports et travaux publics: Les chemins de fer d'intérêt local en France: *Porte (Marcel)*. Chronique législative: Mai 1912: 1. Débats

FRANCE—Contd.

Revue d'Économie Politique. 1912—Contd.*July–August—Contd.*

législatifs. Le contrôle des finances publiques, à propos du budget de 1913.—2. Documents officiels.—Juin 1912.

September–October—Le salaire réel et sa nouvelle orientation *Aftalion (Albert)*. De l'unité du crédit à court terme sous la variété de ses formes: *Ansiaux (Maurice)*. Le rachat du Gothard: *Achard (A.)*. Les banques aux États-Unis: *François (G.)*.

Revue des Sciences Politiques. 1912—

July–August—Le budget de l'Alsace-Lorraine: *Antony (Alfred)*. La criminalité contemporaine: *Viple (J.)*. Chronique financière (1911): *Henry (L. Paul)*.

September–October—Le régime douanier colonial: *Pégard (Pierre)*. La question monétaire en Argentine: *Tannery (Jean)*.

GERMANY—

Archiv für Rassen- und Gesellschafts-Biologie. May–June, 1912—Zur Frage nach der generativen Tüchtigkeit der deutschen Frauen und der rassenhygienischen Bedeutung der ärztlichen Geburtshilfe: *Bluhm (Dr. Agnes)*. Die Ernährung der ländlichen Bevölkerung in 30 rheinischen kleinbäuerischen Familien im Jahre 1910 und die Ursachen der Fettüberernährung in Stadt und Land: *Claassen (Dr. Walter)*.

Archiv für Sozialwissenschaft und Sozialpolitik. 1912—

July—Fleischteuerung und Getreidezölle: *Esslen (Joseph B.)*. Die Bevormundung der gesetzgebenden Gewalt durch die Gerichte und die Trustfrage in den Vereinigten Staaten: *Boudin (L. B.)*. Versuch einer reinen und realistisch-empirischen Theorie des Konsumentenmonopols: *Lederer (Dr. Emil)*. Kritische Betrachtungen zum Streite über das Bevölkerungsproblem: *Salz (Dr. Arthur)*. Berufswahl und Berufsschicksal des modernen Industriearbeiters: *Bernays (Dr. Marie)*. Das Mindestlohngesetz im englischen Kohlenbergbau: *Pumpiansky (Dr. L.)*. Italienische Agrarprobleme. Die innere Kolonisation in Italien und die Campagna: *Leonhard (Dr. R.)*. Die moderne Finanz im Licht der Marx'schen Theorie: *Bernstein (E.)*. Angestelltenorganisation und Sozialpolitik.

September—Ueber Gesetzmässigkeiten in der Geschichte (historische Gesetze): *Eulenburg (Dr. Franz)*. List's Nationales System und die "Nationale" Wirtschaftspolitik: *Dietzel (Dr. Heinrich)*. Arbeiterversicherung und Armenwesen in Deutschland: *Zahn (Dr. F.)*. Zur Rentabilität der Miethäuser für den Eigentümer in Dresden: *Schmidt (Dr. Georg)*.

GERMANY—Contd.

Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft (Schmoller's). 1912—

Heft 3—Erkenntniskritik und Staatswissenschaft: *Jäger* (Georg). Gerechtigkeit und Kommunismus in der heutigen Volkswirtschaft: *Oldenberg* (Karl). Die amerikanischen Staatslegislaturen: *Brucke* (Ernest). Die Einführung der Schiffsabgaben im Deutschen Reiche: *Grosch* (G.). Reform der Reichsbank? *Werner* (Franz). Meisterkurse: *Wüllen* (Josef). Internationale Organisations-Leistungen und Bestrebungen auf dem Gebiete der Landwirtschaft: *Rudloff* (Hans L.). Der Nationalismus und seine Wurzeln: *Mitscherlich* (Waldemar). Staatsbürgerliche Erziehung. Eine Rundschau: *Eckert* (Christian). Die Umkehrung der Sozialwirtschaftslehre: *Zimmermann* (Waldemar). Die wissenschaftlichen Ergebnisse des Soziologentages: *Köhler* (Walther). Redlichs Recht und Technik des englischen Parlamentarismus: *Lager* (Mar).

Heft 4—Theorie des Sparens und der Kapitalbildung: *Liefmann* (Robert). Der preussische Staatsschatz und der Reichskriegsschatz: *Katzenstein* (Luis). Ein Vorschlag zur Reichsbesitzsteuer: *Serin* (Ludwig). Das Wirtschaftsleben der Vereinigten Staaten im ersten Jahrzehnt des 20. Jahrhunderts: *Schultze* (Ernst). Rhein und Mississippi: *Clapp* (Edwin J.). Der Staat und die Seekabel: *Roscher* (Max). Gewerbeförderungsanstalten. (Maschinenausstellungen, technische Beratungs- und Maschinenvermittlungstellen): *Wüllen* (Josef). Agrarverfassung und Grundsteuer in Britisch-Ostindien: *Leyden* (Victor). Nordamerikanische Universitätseinrichtungen. Nachwort von G. Schmoller: *Fullerton* (George Stuart). Der wirtschaftliche Fortschritt und die Aufgaben einer geschichtlichen Entwicklungsmechanik: *Breysig* (Kurt). *Boutroux*' Begriff des Naturgesetzes: *Köhler* (Walther).

Jahrbücher für Nationalökonomie und Statistik (Conrad's). 1912—

August—Die französische Kolonisation in Tunis: *Leonhardt* (Rudolf). Das Zurückgehen der Bedeutung der Zentralnotenbanken (Fortsetzung und Schluss): *Helander* (Sven). Die schweizerische Kranken- und Unfallversicherung: *Gygax* (Paul). Kommunalbesteuerung und Kommunalverschuldung in Preussen: *Gehrig* (Hans). Die Wirkungen der Bekanntmachung des Reichskanzlers vom 19. Dezember, 1908, betreffend den Betrieb der Anlagen der Grosseisenindustrie: *Wiskott* (Ernst).

September—Die neuzeitliche Entwicklung der Baumwollpreise und das Baumwollpreisproblem: *Apelt* (K.). Die wirtschaftliche Gesetzgebung des Deutschen Reiches im Jahre 1911. Die Fortschritte des Arbeitstarifvertrages in Deutschland, Oesterreich und Grossbritannien: *Köppe* (H.). Ueber Getreide-Einfuhrscheine: *Hampke*. Hat Oppenheimer die Grenznutzentheorie widerlegt? *Albrecht* (G.).

GERMANY—*Contd.*

Jahrbücher für Nationalökonomie und Statistik (Conrad's). 1912—*Contd.*

October—Stadtverfassung und Zünfte Freiburgs im Breisgau.

Ein Beitrag zur oberrheinischen Wirtschaftsgeschichte: *Ehrler (Joseph)*. Die neuere volkswirtschaftliche Gesetzgebung Schwedens: *Helander (Sven)*. Zur Statistik der deutschen Seeschifffahrt seit 1875: *Schellwien (Johs.)*. Baumwollproduktion und Baumwollindustrie in Britisch-Indien: *Schultze (Ernst)*.

Zeitschrift für Sozialwissenschaft. 1912—

Heft 7-8—Ein kathedersozialistisches System der Volkswirtschaftslehre: *Pohle (L.)*. Die Entwicklung der Handelsbeziehungen Kanadas zu den Vereinigten Staaten mit besonderer Berücksichtigung Englands: *Schultze (E.)*. Die Entwicklungsrichtungen der deutschen Volkswirtschaft nach den Ergebnissen der neuesten Statistik: *Mendelson (M.)*.

Heft 9—Die Entwicklung der Handelsbeziehungen Kanadas zu den Vereinigten Staaten mit besonderer Berücksichtigung Englands: *Schultze (E.)*. Die Entwicklungsrichtungen der deutschen Volkswirtschaft nach den Ergebnissen der neuesten Statistik: *Mendelson (M.)*.

Heft 10—Die Entwicklung der Handelsbeziehungen Kanadas zu den Vereinigten Staaten mit besonderer Berücksichtigung Englands: *Schultze (E.)*. Die Entwicklungsrichtungen der deutschen Volkswirtschaft nach den Ergebnissen der neuesten Statistik: *Mendelson (M.)*. Das Prinzip von Leistung und Gegenleistung als theoretisches Problem: *Conrad (Otto)* und *Oswalt (H.)*.

Heft 11—Arbeitslohn und Produktionstechnik in der Heimarbeit: *Schmidt (E.)*. Die Entwicklungsrichtungen der deutschen Volkswirtschaft nach den Ergebnissen der neuesten Statistik: *Mendelson (H.)*. Die Entwicklung der Handelsbeziehungen Kanadas zu den Vereinigten Staaten mit besonderer Berücksichtigung Englands: *Schultze (E.)*.

Zeitschrift für die gesamte Staatswissenschaft. *Heft 4*—Die Frage der Arbeitslosigkeit in der klassischen Nationalökonomie: *Lipowski (J.)*. Theorie der Verteilung: *Kellenberger (E.)*. Warenhaus und Warenhaussteuer: *Zimmermann (F. W. R.)*.

Zeitschrift für die gesamte Versicherungs-Wissenschaft. 1912—

September—Der Auslese-Koeffizient: *Jastremsky (B.)*. Die deutsche Versicherungsliteratur des 18. Jahrhunderts. (8. Personenversicherung): *Neumann (Dr.)*.

November—Belastung durch die deutsche Arbeiterversicherung: *Zahn (Dr.)*. Der VII. Internationale Kongress für Versicherungs-Wissenschaft zu Amsterdam: *Broecker (Dr.)*.

ITALY—

Giornale degli Economisti e Rivista di statistica. 1912—

April-May—Studi di economia finanziaria: *Baroue (E.)*. Relazioni fra entrata e consumo: *Del Vecchio (G.)*. La politica doganale del Piemonte dal 1815 al 1834: *D'Ajano (R. Broglio)*.

ITALY—*Contd.*

Giornale degli Economisti e Rivista di statistica. 1912—*Contd.*

June—Studi di economia finanziaria: *Barone (E.)*. La crisi cotoniera e l'industria del cotone in Italia: *Nola (C. di)*.

July-August—Studi di economia finanziaria: *Barone (E.)*. Paretaio e spirito paretiano: *Amoroso (L.)*. Una famiglia di mezzadri in provincia di Parma: *Dolfin (S.)*. L'ultima fase della industria della potassa in Germania: *Caroncini (A.)*.

September—La distribuzione della ricchezza come fenomeno di diffusione: *Amoroso (L.)*. Per il regime doganale della Libia: *Marcelli (G.)*.

La Riforma Sociale. 1912—

July-August-September—Della tassa domestici e di alcuni minori tributi locali: *Geisser (Alberto)*. Per la perequazione catastale: come la grande impresa vien fatta degenerare innanzi che sia finita: *Einaudi (Luigi)*. Le banche popolari in Italia.

October—Le finanze della guerra: *Flora (Federico)*. L'assicurazione contro la disoccupazione in Svizzera: *Weigmann (M.)*. Le statistiche dei prezzi delle derrate alimentari: *Alberti (Mario)*.

Rivista Italiana di Sociologia. *May-August*, 1912—Contributi statistici ai problemi dell'eugenica: *Gini (C.)*.

SWITZERLAND—

Journal de Statistique Suisse. 1912—

Lieferung 4—Die direkte Staatssteuer im Kanton Solothurn: *Kaufmann (G.)*.

Lieferung 5—Statistique de la superficie de la Suisse: *Anderegg (E. und Dr. H.)*.

Lieferung 6—Ein Beitrag zur Erkenntnis der Verschuldung des bauerlichen Grundbesitzes im Kanton Zürich: *Wolf (Dr. Arthur)*. Die Studentenverbindung Concordia in Bern, 1862 bis 1912: *Anderegg (Dr. H.)*.

Lieferung 7—Protokoll der Jahresversammlung der schweizerischen statistischen Gesellschaft und des Verbandes schweizerischer amtlicher Statistiker. Montag den 2. Oktober 1911, in Schwyz.

LIST OF ADDITIONS TO THE LIBRARY.

During the period that has elapsed since July 8, 1912, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

(a) Foreign Countries.

Argentine Republic—

Agriculture. Map of area, population, railways, cultivation and cattle. 1911. Sheet. 1912. (The Ministry of Agriculture.)

Austria—

Census. Ergebnisse der Volkszählung vom 31. Dezember 1910. Heft 1. Die summarischen Ergebnisse der Volkszählung. 4to. 1912. (The Central Statistical Commission.)

Elections. Ergebnisse der Reichsratswahlen im Jahre 1911. 4to. 1912. (*Id.*)

Labour. KK. Arbeitsstatistisches Amt. Protokoll der 31ten Sitzung des Arbeitsbeirates vom 17. und 18. Mai 1912 und 32ten Sitzung vom 24. Juni 1912. 2 vols., 8vo. 1912. (The Austrian Labour Department.)

— Die Arbeitszeit in Glashütten. Bericht über die in der Zeit. 14. Juni-14. August 1909 durchgeführte Erhebung. 4to. 1911. (*Id.*)

Land. Kataster der Gewerbegeossenschaften und deren Verbände in Niederösterreich. 1. Abteilung. 1. Band. Die Gewerbegeossenschaftler und deren Verbände. La. 8vo. 1912. (The Ministry of Commerce.)

Trade. Statistik des Verkehrs für 1906 und 1907. 1. Abteilung: Landstrassen, Wasserstrassen, Flussschifffahrt. Fol. 1912. (The Central Statistical Commission.)

Bosnia and Herzegovina. Census. Die Ergebnisse der Volkszählung in Bosnien und der Hercegovina vom 10. October 1910. Fol. 1912. (The Statistical Department.)

Belgium—

Education. Rapport triennial sur l'état de l'enseignement moyen en Belgique. 19^e période triennale 1906-08. Fol. 1910. (The General Register Office, London.)

Industries. Statistique des cuirs et peaux bruts (1905 à 1909) suivie d'un aperçu relatif à la consommation de la viande. 8vo. 1912. (The Ministry of Industry and Labour.)

Labour. Conseil Supérieur du Travail. 11^e Session 1911. Conventions collectives de travail. Documents préliminaires. Rapport de la Commission spéciale et Projet de loi. Discussion. 4to. 1911. (*Id.*)

Mines. Statistique Rétrospective des Industries extractives et métallurgiques en Belgique pour 1901-10. 8vo. 1912. (*Id.*)

Instituts Solvay. La politique de réforme sociale en Angleterre. Conférences de l'Eighty Club. 8vo. 1912. (MM. Misch et Thron.)

Chile—

Census. Poblacion calulada de la Republica de Chile en 1910 i Reseña del Movimiento de poblacion del mismo año. 8vo. 1912. (The Director-General of Statistics.)

France—

Agriculture. Enquête sur les salaires agricoles. 8vo. 1912. (The Ministry of Agriculture.)

Census. Résultats statistiques du Recensement général de la Population effectué le 4 Mars 1906. Tome I.—Quatrième Partie. Population active par Arrondissement. Population active suivant la Profession individuelle. Sm. 4to. 1911. (The Chief of General Statistics of France.)

(a) Foreign Countries—*Contd.***France—*Contd.***

- Fisheries. Statistique des Pêches maritimes. Année 1909. 8vo. 1912. (The Ministry of Marine.)
- Labour. Conseil supérieur du Travail. 21^e Session. Novembre, 1911. Compte rendu. 4to. 1912. (The Chief of General Statistics of France.)
- La réglementation du travail des employés. Rapport de M. Artaud. Rapport de M. Honoré. Procès-Verbaux, Enquête, et Documents. Sm. 4to. 1912. (*Id.*)
- Power. Statistique des forces motrices en 1906. 4to. 1911. (*Id.*)
- Public Works. Actes législatifs et dépenses concernant les travaux de Navigation intérieure et maritime, 1901-10. 4to. 1912. (The Ministry of Public Works.)
- Statistics. Bulletin du Conseil Supérieur de Statistique. No. 11. Compte rendu des Sessions de 1908 et 1912. 8vo. 1912. (The Chief of General Statistics of France.)
- Lyons.* Syndicat de l'Union des Marchands de Soie de Lyon. Statistique de la production de la Soie en France et à l'étranger. 41^e Année. Récolte de 1911. 8vo. 1912. (The Union.)
- Liste des Victimes du Tribunal Révolutionnaire à Paris. 194 pp., 8vo. Paris, 1911. (Messrs. Picard et Fils.)

Germany—

- Census. Berufs- und Betriebszählung vom 12. Juni 1907. Landwirtschaftliche Betriebsstatistik. Teil 2b Zusammenfassende Darstellung der Ergebnisse. 4to. 1912. (The Imperial Statistical Bureau.)
- Elections. Die Reichstagswahlen von 1912. Heft 1. Vergleichende Übersicht der Reichstagswahlen von 1907 und 1912. 4to. 1912. (*Id.*)
- Insurance. Amtliche Nachrichten des Reichsversicherungsamts 1912. 1. Beiheft. Statistik der Heilbehandlung bei den Versicherungsanstalten und zugelassenen Kasseneinrichtungen der Invalidenversicherung für 1906-11. 4to. 1912. (The Imperial Insurance Bureau.)
- Labour. Erhebung über die Arbeitsverhältnisse der Angestellten der Rechtsanwälte veranstaltet im Februar 1911. Fol. 1911. (The Imperial Statistical Bureau.)
- Municipal. Verband Deutscher Städtestatistiker. Protocoll . . . 25 Konferenz der Vorstände statistischer Ämter Deutscher Städte. Fol. 1912. (The Statistical Bureau of Dresden.)
- Alsace-Lorraine.* Elections, Die Reichstagswahlen von 1912 und die Reichstagswahlen seit 1874 in Elsass-Lothringen. 8vo. 1912. (The Statistical Bureau of Alsace and Lorraine.)
- Bavaria.* Säuglingsfürsorge in Bayern in den Jahren 1908, 1909, 1910. (Mit Karte.) Fol. 1912. (The Statistical Bureau of Bavaria.)
- Düsseldorf.* Taschenbuch des statistischen Amts der Stadt Düsseldorf. Hauptziffern aus der Reichs- Staats- und Stadt-Statistik, 1912. Vierte vermehrte Auflage. Sm. 8vo. 1912. (The Municipal Statistical Bureau.)
- Frankfort—*
- Labour. Statistische Übersichten über die Geschäftstätigkeit der öffentlichen Arbeitsvermittlungstellen des Mitteldeutschen Arbeitsnachweisverbandes im Geschäftsjahr 1911-12 mit einem Anhang betr. die städtische Arbeitsvermittlungstelle Frankfurt a.M. 32 pp., 4to. 1912. (The Municipal Statistical Bureau.)
- Prices. Beiträge zur Statistik der Stadt Frankfurt am Main. Heft 10. Die Preisbewegungen auf dem Lebensmittelmarkt zu Frankfurt a.M. und deren Einfluss auf die Haushaltsführung der Bevölkerung. 63 pp., 8vo. 1912. (*Id.*)
- Munich—*
- Domestic servants. Einzelschriften des Statistischen Amtes der Stadt München. Nr. 10. Die weiblichen Dienstmädchen in München. Eine Untersuchung ihrer Wirtschaftlichen und sozialen Lage nach den amtlichen Erhebungen vom Jahre 1909. 75 pp., 8vo. 1912. (The Municipal Statistical Bureau.)

(a) Foreign Countries—*Contd.***Germany—***Contd.**Munich—Contd.*

Housing. Der Wohnungsmarkt in München. Statistische Mitteilungen über seine gegenwärtige Lage und seine Entwicklung in den letzten Jahrzehnten. 1. Vorbemerkungen. 20 pp., fol. 1912. (The Municipal Statistical Bureau.)

Unemployment. Veröffentlichung des Statistischen Amtes der Stadt München. Die Arbeitslosenzählung in München und seiner Umgebung vom 11. Februar 1912. 30 pp., 4to. 1912. (*Id.*)

Sammlung von Versicherungsbedingungen deutscher Versicherungsanstalten. Herausgegeben vom Deutschen Verein für Versicherungs-Wissenschaft. Teil 5. Die in Jahre 1912 geltenden Bedingungen sämtlicher Versicherungszweige. 1. Hälfte. Lebens-, Unfall- und Haftpflichtversicherung. 187 pp., 8vo. Berlin, 1912. (The Association.)

Hungary—

Municipal. Statistisches Jahrbuch der Ungarischen Städte. Herausgegeben vom Landeskongress der Ungarischen Städte. Redigiert von Prof. Dr. Gustav Thirring. 1. Jahrgang. La. 8vo. Budapest, 1912. (The Compiler.)

Budapest—

Births, &c. Die Bewegung der Bevölkerung in Budapest in den Jahren 1906-07, und Statistik der Volksbewegung von 1874 bis 1907. 8vo. 1912. (The Municipal Statistical Bureau.)

Education. Das Unterrichtswesen der Stadt Budapest im Jahre 1907-08. 8vo. 1911. (*Id.*)

Italy—

Annali di Statistica. Atti del Consiglio superiore di statistica. Sessione luglio 1910 e maggio 1912. 2 vols., 8vo. 1912. (The Director-General of Statistics.)

Annali di Statistica. Giorgio Mortara. Sulle variazioni di frequenza di alcuni fenomeni demografici rari. Le variazioni della mortalità da generazione a generazione in Svezia. 8vo. 1912. (*Id.*)

Justice. Statistica giudiziaria civile e commerciale e statistica notarile, 1897-1906. 3 vols., 8vo. 1911. (*Id.*)

Florence. Monografie e Studi dell'Ufficio di Statistica. N. 4. Il Comune di Firenze e la sua popolazione al 10 giugno 1911. Studi demografici sul v censimento generale della popolazione. 8vo. 1912. (The Municipal Statistical Bureau.)

Palermo. Annuario biografico del Circolo matematico di Palermo, 1912. 8vo. 1912. (The Institution.)

Venice. Relazione sul v Censimento demografico e i Censimento degli opifici ed imprese industriali, 10-11 giugno 1911. La. 8vo. 1912. (The Municipal Statistical Bureau.)

Japan—

Births, &c. Mouvement de la population de l'Empire de Japon, 1899-1908. (Dispositions sur la manière de recueillir des renseignements.) (Proportions.) Fol. 1912. (The Bureau of General Statistics.)

Mexico—

Companies. Noticia del movimiento de Sociedades mineras y mercantiles habido en la Oficina del Registro público de la Propiedad y del comercio durante 1886 à 1910. Fol. 1911. (The Director-General of Statistics.)

Netherlands—

Elections. Kiezersstatistiek benevens aanvulling der Verkiezingsstatistiek in 1912. 8vo. 1912. (The Central Statistical Bureau.)

Occupational Mortality. Statistiek van de sterfte onder de mannen, met onderscheiding naar het beroep en in verband met leeftijden en doodsoorzaken in 1896-1903. Fol. 1912. (*Id.*)

(a) Foreign Countries—*Contd.***Netherlands—*Contd.***

Amsterdam. Statistische Mitteilungen. No. 38. Reproduktion der wichtigsten graphischen Darstellungen von dem Statistischen Amt Amsterdam: vorgeführt auf der Internationalen Hygiene-Ausstellung Dresden, 1911, nebst erläuterndem Zahlenmaterial. Fol. 1912. (The Municipal Statistical Bureau.)

Norway—

Administrative Divisions. Norges civile, geistlige og judicielle Inddeling April 1912. Svo. 1912. (The Central Statistical Bureau.)

Children. Statistique concernant le traitement des enfants moralement abandonnés. Années 1908 et 1909. Svo. 1912. (*Id.*)

Education. Écoles professionnelles, 1908-09-1910-11. Svo. 1912. (*Id.*)

Labour. Salaries, &c., des commis de commerce en 1909. Svo. 1912. (*Id.*)

Leprosy. Rapport sur les lépreux en Norvège pour les années, 1906-10. Svo. 1912. (*Id.*)

Railways. Les chemins de fer publics de la Norvège. Svo. 1912. (*Id.*)

— Tillæg til Beretning om de Norske Jernbaners drift 1 Juli 1910-30 Juni 1911. Grafiske Fremstillinger (Tableaux graphiques). Svo. 1912. (*Id.*)

Portugal—

Annuario Estatístico de Portugal, 1900. Vols. 1 and 2 of 1903. Vol. 1 of 1904-05. 4 vols., Svo. 1907-11. (The Director-General of Statistics.)

Agriculture. Statistique agricole. Evaluation de la récolte de vin au Portugal en 1911. 11 pp., Svo. 1912. (*Id.*)

— Statistique agricole. Résumés statistiques. Fasc. 1. Svo. 1912. (*Id.*)

Roumania—

Births. Mouvement de la Population de la Roumanie en 1901-03. Données définitives. Fol. 1911. (The General Register Office.)

Russia—

Agriculture. Recueil de données statistiques et économiques sur l'industrie agricole en Russie et dans les Pays étrangers. 1^{re}, 3^e, 4^e, et 5^e années. 4 vols., fol. and Svo. 1907-12. (The Director-General of Agricultural Organisation.)

Moscow. Recensement de Moscou, 1912. Données préliminaires. (2 parts of 4 pp. each). Svo. 1912. (The Municipal Statistical Bureau.)

Sweden—

Bidrag till Sveriges Officiella Statistik. H. Kungl. Maj:ts. Befallnings-hafvandes Femårsberättelser, för 1901-05 . . . 4to. 1912. X. Aflönings- och Pensionsstatistik, 1912. (Wages, &c.) 4to. 1912. (The Central Statistical Bureau.)

Labour. Les Lock-Out et la Grève générale en Suède en 1909. Rapport présenté par l'Office du Travail à l'Administration royale de l'Industrie et du Commerce. Svo. 1912. (The Swedish Labour Department.)

Life Tables. Statistiska Meddelanden. Dödlighets- och Lifslängdstabeller för åren 1816-1910. 31 pp., Svo. 1912. (The Central Statistical Bureau.)

XV^e Congrès international d'Hygiène et de Démographie. Tables de mortalité et de survie en Suède pour 1816-1910 élaborées par le Bureau central de statistique de Suède. 31 pp., Svo. 1912. (*Id.*)

Switzerland—

Census. Résultats du recensement fédéral des entreprises agricoles, industrielles et commerciales, 1905. Vol. 4e. Entreprises commerciales, établissements de transport, voies de communication et professions libérales. 4to. 1912. (The Federal Statistical Bureau.)

Savings Banks. Statistique des caisses d'épargne de la Suisse, 1908. 4to. 1912. (*Id.*)

(a) Foreign Countries—*Contd.***Switzerland—*Contd.***

Bern (Canton). Hauptergebnisse der vom Kantonalen statistischen Bureau im Auftrag der Landwirtschaftsdirektion vorgenommenen Ermittlungen über die Schlachtvieh- und Fleischpreise in 22 grösseren Ortschaften oder Städten der Schweiz und speziell in der Stadt Bern pro 1911. 8 pp. and tables. Svo. Bern. 1912. (The Statistical Bureau.)

United States—

Agriculture. Cotton crops of the United States, 1790-1911. 9 pp., 8vo. 1912. (The Department of Agriculture.)

— Hop Crop of the United States, 1790-1911. 8 pp., 8vo. (*Id.*)

— Reduction of Waste in Marketing. Svo. 1912. (*Id.*)

— Year-book of United States Department of Agriculture. Years 1909, 1910 and 1911. 3 vols., Svo. 1910-12. (*Id.*)

Census Bureau. Bulletin 114. Cotton Production, 1911. 4to. 1912. (The Bureau.)

— Thirteenth Census, 1910. Bulletin. Agriculture. United States, Abstract: Live Stock on Farms and elsewhere. 34 pp., 4to. 1912. (*Id.*)

— Thirteenth Census, 1910. Bulletin. Agriculture. United States, Abstract: General Farm Crops, by States. 28 pp., 4to. 1912. (*Id.*)

Finance. Annual Reports of Secretary of Treasury on State of Finances for fiscal years ended June 30, 1909, 1910 and 1911. 3 vols., 8vo. 1911. (The Treasury Department.)

Labour. Report on condition of Woman and Child Wage-Earners in United States, in 19 vols. Vol. xvii: Hookworm disease among Cotton-mill operatives. Svo. 1912. (The Department of Commerce and Labour.)

Prices. Retail Prices, 1890 to 1911. Bulletin of U.S. Bureau of Labour, Whole Number 105. Part 1. Svo. 1912. (*Id.*)

— Retail Prices, 1890 to 1912. Bulletin of U.S. Bureau of Labour, Whole Number 106. Part 1. Svo. 1912. (*Id.*)

Tariffs. Foreign Tariff Notes, No. 7. With cumulative Index for Nos. 1 to 7. Svo. 1912. (*Id.*)

— Tariff Series, No. 25A. Supplement to Tariff of France. Changes in Tariff and Customs Regulations. 14 pp., 8vo. 1912. (*Id.*)

— Tariff Series, No. 28. Customs Tariff of Japan. Svo. 1912. (*Id.*)

Boston. Social Research Council of Boston. Bulletin No. 1. Preliminary list of recent social investigations. July, 1912. 42 pp., 8vo. 1912. (The Council.)

Chicago. 54th Annual Report of Trade and Commerce of Chicago for 1911. Svo. 1912. (The Secretary.)

New York (City). Sixth Report of Tenement House Department, 1910 and 1911. Svo. 1912. (The Department.)

American Academy of Political and Social Science. Annals. Vol. XLIV, November, 1912, No. 133. The Outlook for Industrial Peace, and supplement: The Reconstruction of Economic Theory, by S. N. Patten, Ph.D. 2 vols., Svo. 1912. (The Academy.)

Columbia University Studies—

Vol. 49, No. 1. British Radicalism, 1791-97: *Walter P. Hall*. Svo. 1912. (Messrs. P. S. King and Son.)

Vol. 49, No. 2. Comparative study of the law of corporations, with particular reference to the protection of creditors and shareholders: *Arthur K. Kuhn*. Svo. 1912. (*Id.*)

Vol. 49, No. 3. The negro at work in New York City. A study in economic progress: *George E. Haynes*. Svo. 1912. (*Id.*)

Vol. 50, No. 1. The spirit of Chinese philanthropy. A study in mutual aid: *Yu-Yu Tsu*. Svo. 1912. (*Id.*)

Vol. 52, No. 1. Provincial and local taxation in Canada: *Solomon Fineberg*. Svo. 1912. (*Id.*)

Uruguay—

Anuario estadístico. Anno 1907-08. Tome 2, Parte 2, and Tome 2, Parte 3. Censo General de la Republica en 1908. 2 vols., la. Svo. 1911. (The Statistical Bureau.)

(a) Foreign Countries—*Contd.***International—**

Institut International d'Agriculture. Annuaire international de statistique agricole 1910. Svo. 1912. (The Institute.)

— Etude méthodologique et statistique sur les recensements de la population agricole, les salaires de la main-d'œuvre rurale et les courants d'émigration dans les différents Etats. xi + 161 pp., fol. 1912. (*Id.*)

International Eugenics Congress. Problems in Eugenics. Papers communicated to the First Congress held in London, July 24th to 30th, 1912. xix + 490 pp., Svo. 1912. (The Hon. Secretary.)

(b) India and Colonies.

India, British—

Census of India, 1911. Vol. ix. Burma. Part 1, Report. Part 2, Tables. 2 vols., fol. 1912. (The India Office.)

— Vol. xi. Coorg. Report and Tables. Fol. 1912. (*Id.*)

— Vol. xii. Madras. Part 1, Report. Part 2, Imperial and Provincial Tables. 2 vols., fol. 1912. (*Id.*)

— Vols. xvi and xvii. Baroda. Part 1, Report. Part 2, Tables. 2 vols., fol. 1912. (*Id.*)

Prices. Variations in Indian Price Levels from 1861 to 1911, expressed in Index Numbers. Fol. 1912. (The Director-General of Commercial Intelligence.)

Bengal. District Gazetteers, Hooghly and Jessore. 2 vols., Svo. 1912. (The India Office.)

Burma Gazetteer. Mergui District. Vol. A. Svo. 1912. (*Id.*)

Central Provinces. Amraoti District Gazetteer. Vol. A. Svo. 1911. (*Id.*)

Eastern Bengal. District Gazetteer. Vol. 12. Rangpur. Svo. 1911. (*Id.*)

United Provinces. District Gazetteer. Vol. 9. Farrukhabad. Vol. 13.

Bareilly. Vol. 35. Almora. 3 vols., Svo. 1911. (*Id.*)

Punjab. Report on operations of Paper Currency Department in Lahore Circle, and on movement of funds in Punjab and North-West Frontier Province, for year 1911-12. By A. Montagu Brigstocke, I.C.S. 62 pp., fol. 1912. (The Author.)

Pasteur Institute of India. 11th annual report of Central Committee of the Association, with report of Director of Pasteur Institute at Kasauli for 1911. 30 pp., Svo. Lahore, 1912. (The Director.)

Australia, Commonwealth of—

Census of April 3rd, 1911. Census Bulletins: Nos. 9, Education. 10, Blindness and Deaf-Mutism. 11, Schooling. 12, Conjugal condition. 13, Localities. Fol. 1912. (The Commonwealth Bureau of Census and Statistics.)

Conference of Statisticians of the States of Australia. March, 1912. 17 pp., fol. 1912. (The Government Statistician of New South Wales.)

New South Wales. Establishment of Superannuation Fund for whole of Government Services, including Municipal and Shire Services. Report of Committee and of Actuarial Sub-Committee. Fol. 1912. (The Bureau of Statistics.)

Queensland. A-B-C of Queensland Statistics. 1912. Svo. 1912. (The Government Statistician.)

South Australia. Proceedings of Parliament of South Australia, with copies of documents ordered to be printed, 1912. 4 vols., fol. 1912. (The Government Printing Office.)

Tasmania. Victorian Friendly Societies' Experience, 1903-07. Methods employed in investigation of experience, rates of sickness, mortality and secession and monetary tables based on experience. 39 pp., fol. 1912. (The Government Statistician.)

Western Australia. Statistical View of Eighty-Three Years' Progress, in Western Australia, 1829-1911. Fol. 1912. (The Registrar-General.)

Borneo—

Brunei Census, March, 1911. Fol. 1911. (The Colonial Office.)

(b) **India and Colonies—Contd.****Canada, Dominion of—**

Debates, House of Commons, Dominion of Canada. Session 1910-11. 5 vols., 8vo. 1911. (The Clerk of House of Commons.)

Manitoba. Statutes of Manitoba. 2. George V. Vols. 1 and 2. 1912. 8vo. 1912. (The King's Printer, Winnipeg.)

Ceylon—

Census of Ceylon, 1911. Estate Statistics. The Estate Population by Sex, Race, Religion, Age, Civil Condition, Education, and Birthplace. With list of estates, showing revenues and planting districts, and population by Sex, Race, Religion, and Literacy, and an Alphabetical Index of Estate Names. 55 pp., fol. 1912. (The Superintendent of Census.)

— Town and Village Statistics. Fol. 1912. (*Id.*)

Jamaica—

Supplement to Jamaica Gazette. Vol. 34, No. 11, containing the Census of Turks and Caicos Islands, 1911. Fol. 1911. (The Colonial Office.)

Mauritius—

Census. Report on Census Enumeration made in Mauritius and its Dependencies, 31st March, 1911. Fol. 1912. (The Census Commissioner.)

(Another copy presented by the Colonial Office.)

Studies in Mauritian Statistics. Being discussions of certain social and economic problems, either arising out of or intimately dependent on the Census Enumeration of 31st March, 1911. 1. Agricultural Labour. By A. Walter, F.R.A.S. Fol. 1912. (The Author.)

New Zealand—

Cost of living. Report of Commission on Cost of Living in New Zealand, with Minutes of Proceedings and Evidence. 2 vols., fol. 1912. (The Department of Labour.)

Insurance Department. Statements in connection with valuation of liabilities (fourth and fifth schedules) for Triennium ending December 31st, 1911. Fol. 1912. (The Insurance Department.)

— Actuary's Report on Valuation of the Government Insurance Department, as at December 31st, 1911. Fol. 1912. (The Insurance Department.)

— Teachers' Superannuation Fund. Report by Actuary on the Fund. 12 pp., fol. 1912. (The Insurance Department.)

Southern Rhodesia—

Report of Director of Census regarding the Census taken on 7th May, 1911. Fol. 1912. (The Colonial Office.)

Union of South Africa—

Census of Union of South Africa, 1911. Parts 2, Ages. 3, Education. 4, Conjugal Condition. 3 parts, fol. 1912. (The Director of the Census.)

Occupational Disease. Report of Commission appointed under the Miners' Phthisis Allowances Act No. 34 of 1911, to enquire into prevalence of Miners' Phthisis and Pulmonary Tuberculosis on Mines within the Union, 1912. Revised Edition. Fol. 1912. (Mr. G. D. Maynard.)

(c) **United Kingdom and its several Divisions.****United Kingdom—**

Local Taxation. Appendix to First Report of Departmental Committee on Local Taxation. Vol. 1. Minutes of Evidence. 15th November, 1911, to 1st May, 1912. [Cd-6303-11.] 1912. (Purchased.)

Mortality of Government Life Annuitants. (298.) 1912. (*Id.*)

Motor Cars. Committee on the Horse-Power Rating of Motor Cars. Report. [Cd-6414.] 1912. (*Id.*)

— Minutes of Evidence and Appendices. [Cd-6415.] 1912. (*Id.*)

(c) United Kingdom and its several Divisions—*Contd.***United Kingdom—*Contd.***

- National Insurance Act, 1911. National Health Insurance. Memorandum and Report on Substituted Benefits under Section 13, with Actuarial Memorandum. [Cd-6292.] 1912. (The Secretary.)
- Netherlands. Translation of proposed New General Customs Tariff of the Netherlands. (Revised Draft.) [Cd-6435.] 1912. (Purchased.)
- "Options." Reports on legislative measures respecting Gambling in "Option" and "Future" Contracts. [Cd-6441.] 1912. (*Id.*)
- Publications. Report from Select Committee on Publications and Debates Reports, with Proceedings of Committee, Minutes of Evidence and Appendices. (283.) 1912. (*Id.*)
- Sugar. Commercial. No. 5. (1912.) Correspondence respecting withdrawal of His Majesty's Government from Brussels Sugar Convention. [Cd-6325.] 1912. (*Id.*)
- Tinplates. Report on Conditions of Employment in Manufacture of Tinplates with special reference to the process of Tinning, by Edgar L. Collis, M.B. [Cd-6394.] 1912. (*Id.*)
- Trade of New Zealand. Report for 1911, by His Majesty's Trade Commissioner for the Dominion. [Cd-6440.] 1912. (*Id.*)
- West Africa. Departmental Committee on Matters affecting Currency of British West African Colonies and Protectorates. Report. [Cd-6426.] 1912. (*Id.*)
- Minutes of Evidence. [Cd-6427.] 1912. (*Id.*)
- West Indies. Correspondence with West Indian Colonies relating to Brussels Sugar Convention. [Cd-6282.] 1912. (*Id.*)

England and Wales—

- Board of Agriculture and Fisheries. Statistical Tables relating to catch of Plaice, Haddock, Cod and Hake, by British Trawlers in certain regions and certain areas of North Sea, and landed in England and Wales, during 1906-1910. 40 pp., Svo. 1912. (The Board.)
- Census of England and Wales, 1911. Area, Families or Separate Occupiers, and Population. Vol. 1. Administrative Areas, Counties, Urban and Rural Districts, etc. [Cd-6258.] 1912. (The Census Office.)
- Vol. 2. Registration Areas. [Cd-6259.] Fol. 1912. (*Id.*)
- Vol. 3. Parliamentary Areas. [Cd-6343.] 1912. (*Id.*)
- Local Government Board. Supplement containing Report on Isolation Hospitals by H. Franklin Parsons, M.D., with Introduction by Medical Officer of Board. [Cd-6342.] Svo. 1912. (The Board.)
- London County Council. Financial Abstract. Abstract of Receipts and Expenditure of the Council for 10 years ending 31st March, 1911, with other financial statements. 1901-02 to 1910-11. 40 pp., Svo. 1912. (*Id.*)

Ireland—

- Census of Ireland, 1911. Area, Houses, and Population: also Ages, Civil or Conjugal Condition, Occupations, Birthplaces, Religion and Education of the People. 10 parts, also Summary Tables for the four Provinces in four parts. 1912. (The Census Commissioners.)
- Fisheries. Report of Departmental Committee on Irish Inland Fisheries. [Cd-6433.] 1912. (Purchased.)
- Flax Supply Association. 44th Annual Report for 1911. 57 pp., Svo. Belfast, 1912. (The Association.)

Scotland—

- Board of Agriculture for Scotland. Abstract of Agricultural Returns for Scotland, 1912. 8 pp., Svo. 1912. (The Board.)
- Census of Scotland, 1911. Counties of Edinburgh, Elgin, Fife, Forfar, Haddington, Inverness, Kincardine, Kinross, Kirkcudbright, Linlithgow, Glasgow. Census 1911. Report on Glasgow and its Municipal Wards. Fol. 1912. (The Registrar General of Scotland.)
1912. (The Medical Officer of Health.)

(d) Authors, &c.

- Alberti (Mario)*. Il movimento dei prezzi e dei salari nell' anno 1911 a Trieste con cenni introduttivi circa un programma di futuri lavori statistici, confronti internazionali delle condizioni di vita e di lavoro degli operai ed un'appendice bibliografica. (Pubblicazioni del Museo Commerciale di Trieste.) 114 pp., 8vo. Trieste, 1912. (The Museum.)
- Alderson (A. W.)*. Urban Land, Traffic and Housing Problems. An attempted solution. True "Land Monopoly" and its Advantages. 14 pp., 8vo. London, 1912. (P. S. King and Son.)
- Allen (Sidney E.)*. The Diagrammatic Presentment of the Accounts of Local Authorities. 60 pp., la. 8vo. London, 1912. (Gee and Co.)
- Andras (H. W.)*. Insurance Guide and Hand-Book. Fifth Edition in Two Volumes and Supplement. Vol. 1.—Life Assurance. Vol. 2.—Fire Insurance. Supplement: Historical Review of Life Assurance in Great Britain and Ireland. 3 vols., 8vo. London, 1912. (C. and E. Layton.)
- Arctowski (Henryk)*. Studies on Climate and Crops. The "Solar Constant" and Variations of Atmospheric Temperature at Arequipa and other Stations. 10 pp., 8vo. 1912. (The Author.)
- Arnauné (Aug.)*. La Monnaie, le Crédit, et le Change. 5^e edit. xii + 564 pp., sm. 8vo. Paris, 1913. (Félix Alcan.)
- Ashley (W. J.)*. Gold and Prices. 32 pp., 8vo. London, 1912. (Longmans and Co.)
- Augé-Laribé (Michel)*. L'Évolution de la France agricole. (Le Mouvement Social Contemporain.) xvii + 304 pp., sm. 8vo. Paris, 1912. (Armand Colin.)
- Aupetit (A.), Brocard (L.), Armagnac (J.), Delamotte (G.), Aubert (G.)*. Les grands marchés financiers. France (Paris et Province). Londres, Berlin, New York. 363 pp., 8vo. Paris, 1912. (Purchased.)
- Bachi (Riccardo)*. L'Italia economica nel 1911. . . . Anno III. (Supplement. La Riforma Sociale, June 12.) 8vo. 1912. (The Author.)
- Barbour (Sir David)*, K.C.S.I., K.C.M.G. The standard of value. xvi + 242 pp., 8vo. London, 1912. (Macmillan and Co., Ltd.)
- Barker (J. Ellis)*. Modern Germany. Her political and economic problems, her foreign and domestic policy, her ambitions, and the causes of her successes and of her failures. Fourth edition. viii + 764 pp., 8vo. London, 1912. (Smith, Elder and Co.)
- Barriol (Alfred)*. Le Hasard. 16 pp., 8vo. Paris, 1912. (The Author.)
- Beddoe (John)*. The Rhind Lectureship in Archaeology. The Anthropological History of Europe. Being the Rhind Lectures for 1891 revised to date. 192 pp., 8vo. Paisley, 1912. (Alexander Gardner.)
- Bequemann (Egbert)*. Die Finanzreformversuche im Deutschen Reiche von 1867 bis zur Gegenwart unter Berücksichtigung der Deckung der Wehrvorrägen vom 1912. 145 pp., 8vo. Göttingen, 1912. (Vandenhoeck and Ruprecht.)
- Bernstein (E.)*. Ferdinand Lassalle. Le Réformateur social. Traduit par Victor Dave. (Systèmes et Faits Sociaux.) 228 pp., 8vo. Paris, 1912. (Marcel Rivière and Co.)
- Beveridge (W. H.)*. Unemployment. A Problem of Industry. 3rd edition. xv + 405 pp., 8vo. 1912. (Longmans, Green and Co.)
- Boag (George L.)*. Manual of Railway Statistics. 185 pp., sm. 8vo. London, 1912. (The Railway Gazette Office.)
- Butler (Elizabeth B.)*. Russell Sage Foundation. Saleswomen in mercantile stores, Baltimore, 1909. xv + 217 pp., 8vo. New York, 1912. (Charities Publication Committee, New York.)
- Cannan (Edwin)*, M.A. The Economic Outlook. 312 pp., 8vo. 1912. (The Author.)
- Carvalho (E.)*. Le Calcul des Probabilités et ses applications. ix + 169 pp., 8vo. Paris, 1912. (Purchased.)
- Castle (William), Coulter (John), Davenport (Charles), East (Edward), Tower (William L.)*. Heredity and Eugenics. Lectures summarising recent advances in knowledge in variation, heredity, and evolution, and its relation to plant, animal, and human improvement and welfare. vii + 315 pp., 8vo. 1912. (The Cambridge University Press.)

(d) **Authors, &c.—Contd.**

- Charnwood (Lord)*. Legislation for the Protection of Women. 29 pp., 8vo. London, 1912. (P. S. King and Son.)
- Coletti (Francesco)*. Dell' emigrazione italiana. Cinquanta anni di storia italiana (1860-1910). Pubblicazione fatta sotto gli auspicii del Governo e delle R. Accademia dei Lincei. xii + 278 pp., 8vo. Milan, 1912. (The Author.)
- Cooper (Joseph)*. Cooper's Tabular Guide No. 1 to Ordinary Life Assurance. Sheet. 1912. (The Compiler.)
- Cressaty (Comte)*. L'Egypte d'aujourd'hui, son agriculture, son état économique et politique, ses ressources financières, sa fortune immobilière et sa dette hypothécaire. 245 pp., 8vo. Paris, 1912. (The Author.)
- Denham (E. B.)*. Ceylon at the Census of 1911, being the Review of the results of the Census of 1911. viii + 538 pp., 8vo. Colombo. 1912. (*Id.*)
- Depitre (Edgard)*. La Toile peinte en France au xvii^e et au xviii^e siècles. Industrie. Commerce. Prohibitions. (Bibliothèque d'Histoire Économique.) xvii + 271 pp., 8vo. Paris, 1912. (Marcel Rivière and Co.)
- Dryden (John F.)*. Industrial Insurance past and present. (Published posthumously.) 23 pp., 8vo. Newark, 1912. (The Prudential Insurance Company.)
- Dryden (John Fairfield)*. Founder and President of the Prudential Insurance Company of America, Pioneer of Industrial Insurance in America, United States Senator. (Memorial Volume.) 63 pp., 4to. 1912. (*Id.*)
- Einaudi (Luigi)*. Intorno al concetto di reddito imponibile e di un sistema d'imposte sul reddito consumato. Saggio di una teoria dell' imposta dedotta esclusivamente dal postulato dell' uguaglianza. viii + 104 pp., fol. Torino, 1912. (The Author.)
- Ely (Richard T.)*. Monopolies and Trusts. xl + 284 pp., sm. 8vo. New York, 1912. (Macmillan and Co.)
- Englisch (Dr. Karol Artur de)*. Nationalitätenerhebungsfrage und die Volkszählung. Separatabdruck aus der Zeitschrift "Union." 47 pp., sm. 8vo. Prag, 1909. (The Narodni Rada Ceska.)
- Esslen (Dr. Joseph Bergfried)*. Die Fleischversorgung des Deutschen Reiches. Eine Untersuchung der Ursachen und Wirkungen der Fleischteuerung und der Mittel zur Abhilfe. xiv + 289 pp., 8vo. Stuttgart, 1912. (Ferdinand Enke.)
- Eve (H. Trustram)*.—
- Agricultural Land and Local Taxation. (Journal of the Farmers' Club, May, 1911). 78 pp., 8vo. 1912. (The Author.)
- Single Tax and Rating on Site Values. Memorandum on part of Evidence given by Land Values Group before Departmental Committee on Imperial and Local Taxation; and Valuation of Parish of Paveham, Beds. 43 pp., 8vo. 1912. (*Id.*)
- Fisher (Irring)*.—
- Instability of Gold. 15 pp., 8vo. 1912. (*Id.*)
- Will the Present Upward Trend of World Prices Continue? (Reprinted from "American Economic Review." September, 1912.) 28 pp., 8vo. 1912. (*Id.*)
- A Stable Monetary Yardstick the Remedy for the Rising Cost of Living. 9 pp., 8vo. 1912. (*Id.*)
- Elementary Principles of Economics. xxviii + 531 pp., 8vo. New York, 1912. (Macmillan and Co.)
- Francken (Edmond) and Mahaim (Ernest)*. La Statistique Mathématique en Angleterre. La Loi d'Erreur de M. F. Y. Edgeworth. (Revue Universelle des Mines, &c.) 48 pp., 8vo. Liege, 1908. (Prof. F. Y. Edgeworth.)
- Gerrard (Rev. Thos. J.)*. The Church and Eugenics. Catholic Studies in Social Reform. No. 4. 59 pp., 8vo. London, 1912. (P. S. King and Son.)
- Gibbon (I. G.)*. Medical Benefit in Germany and Denmark. xv + 296 pp., 8vo. London, 1912. (*Id.*)
- Gilman (Charlotte Perkins)*. Women and Economics. A study of the economic relation between men and women as a factor in social evolution. 7th edition, with New Introduction. xi + 357 pp., sm. 8vo, 1912. (G. P. Putnam's Sons.)

(d) **Authors, &c.—Contd.**

- Gini (C).* Variabilità e Mutabilità contributo allo studio delle distribuzioni e delle relazioni statistiche. (Studi Economico-Giuridici. Anno 111, Parte Seconda. R. Università di Cagliari.) 159 pp., Svo. Bologna, 1912. (The Author.)
- Gini (Prof. Corrado).* Contributi statistici al Problemi dell'Eugenico. 112 pp., Svo. Rome, 1912. (*Id.*)
- Green (Charles E.).* The Local Incidence of Cancer. 36 pp., Svo. Edinburgh, 1912. (Wm. Green and Sons.)
- Gunther (Dr. Adolf).* Die deutschen Techniker, ihre Lebens-, Ausbildungs- und Arbeitsverhältnisse. 2 vols. Textband und Tabellenband. 4to. and Svo. Leipzig, 1912. (Duncker and Humblot.)
- Hammond (H. Pierson).* Annual Statements of Insurance Companies. Chapter 68. 77 pp., Svo. 1912. (The Author.)
- Haney (Lewis H.).* History of economic thought. A critical account of the origin and development of the economic theories of the leading thinkers in the leading nations. xvii + 567 pp., sm. Svo. New York, 1911. (Purchased.)
- Haskin (Frederic J.).* The American Government. xvii + 398 pp., Svo. Philadelphia and London, 1912. (The J. B. Lippincott Co.)
- Heron (David), D.Sc.* A second study of extreme alcoholism in adults, with special reference to the Home Office inebriate reformatory data. (Eugenics Laboratory Memoirs, 17.) 95 pp., 4to. London, 1912. (Purchased.)
- Hock (A.).* L'agriculture au Katanga. Possibilités et Réalités. 305 pp., Svo. Brussels, 1912. (The Solvay Institute.)
- Hopkins (J. Castell).* The Canadian Annual Review of Public Affairs, 1911. Eleventh Year of Issue. Svo. Toronto, 1912. (The Author.)
(Another copy presented by the Clerk, House of Commons, Ottawa.)
- Horowicz (K. J.).* Über das Geschlechtsverhältnis bei Zwillingsgeburten. 39 pp., Svo. Göttingen, 1912. (The Author.)
- Humbert (Sylvain).* Le Mouvement Syndical. Histoire des Partis Socialistes en France. 98 pp., sm. Svo. Paris, 1912. (Marcel Rivière.)
- Huskinson (Thomas W.).* The Bank of England's Charters. The cause of our social distress. ix + 140 pp., Svo. London, 1912. (P. S. King and Son.)
- Jacquart (Camille)*—
Essais de Statistique Morale. I. Le Suicide. 106 pp., Svo. Brussels, 1908. (The Author.)
Essais de Statistique Morale. II. Le Divorce et la Séparation de Corps. 163 pp., Svo. Brussels, 1909. (*Id.*)
Essais de Statistique Morale. La Criminalité Belge 1868-1909. 140 pp., Svo. Louvain, 1912. (*Id.*)
- Juszi (Dr. Oskar).* Die Krise der ungarischen Verfassung. Eine Denkschrift. 25 pp., Svo. Budapest, 1912. (*Id.*)
- Kowatsch (Ambr.).* Illustrierte Deutsche Statistik. Diagramme und Stufenkarten. (System Kowatsch.) xxviii + 140 pp., Svo. Berlin, 1912. (Puttkammer und Muhlbrecht.)
- Lescure (Jean)*—
Hausses et Baisses générales des Prix. 42 pp., Svo. Paris, 1912. (Larose et Tenin.)
Les Marchés Financiers de Berlin et de Paris et la Crise Franco-Allemande de Juillet-Octobre 1911. 46 pp., Svo. Paris, 1912. (*Id.*)
- Levasseur (E.).* Histoire du Commerce de la France. Deuxième partie: De 1789 à nos jours. xlv + 869 pp., Svo. Paris, 1912. (Purchased.)
- Loefen (W. F.).* Handelsstatistik oder Zollstatistik? Vorschläge zur Verein-sachung und Verbesserung der Statistik unseres auswärtigen Handels. 69 pp., Svo. 1912. (Phonix-Verlag.)
- MacDonald (Arthur).* Study of Man in connection with establishing laboratories to investigate Criminal, Pauper, and Defective Classes. 11 pp., Svo. Washington, 1912. (The Author.)
- Macfarlane (John J.).* Industrial Philadelphia. From the infant industries of two centuries ago to the giant of to-day. 12 pp., Svo. 1912. (Philadelphia Commercial Museum.)

(d) **Authors, &c.—Contd.**

- Markoff (A. A.)*. Wahrscheinlichkeitsrechnung. Nach der zweiten Auflage des Russischen Werkes übersetzt von Heinrich Liebmann. Mit 7 Figuren im Text. vii + 317 pp., 8vo. Leipzig. (B. G. Teubner.)
- Marr (Igyen)*. A Card System for Friendly Societies' Accounts and Statistics. 46 pp., 8vo. 1908. (Gee and Co.)
- Martin (Étienne)*. Histoire Financière et Économique de l'Angleterre (1066-1902). Tomes 1 and 2. 512 and 642 pp., 2 vols., 8vo. Paris, 1912. (Félix Alcan.)
- Mathieson (C., and Sons)*. Rubber Facts and Figures, No. 9. October, 1912. sm. 8vo. 1912. (Mathieson and Son.)
- Maunder (Colonel F. N.)*. The Science of Organisation and the Art of War. Lecture delivered to Organisation Society, July, 1912. 13 pp., 8vo. 1912. (The Society.)
- Mayr (Dr. Georg von)*—
Nochmals Kriminalstatistik und Kriminalätiologie. 6 pp., 8vo. 1912. (The Author.)
Verwaltungsstatistik. Sonderabdruck aus der Handbuch der Politik. 8 pp. Berlin, 1912. (*Id.*)
- Methorst (H. W.)*—
Die Säuglingssterblichkeit in den Niederlanden und die Untersuchung nach den Ursachen derselben unter Berücksichtigung der Ernährungsweise und der sozialen Verhältnisse der im Jahre 1908 im Haag und Scheveningen geborenen Kinder. 36 pp., 8vo. Leipzig, 1912. (*Id.*)
Letter (in Dutch) to the editor of "Het Kind" in regard to Birth-rates. 4 pp., fol. 1912. (*Id.*)
- Mönckmeier (Wilhelm)*. Die deutsche überseeische Auswanderung. Ein Beitrag zur deutschen Wanderungsgeschichte. x + 269 pp., 8vo. Jena, 1912. (Purchased.)
- Morpurgo (Giulio)*. L'importanza economica della sintesi chimica. 31 pp., 8vo. Trieste, 1912. (Museo commerciale di Trieste.)
- Mortara (Giorgio)*—
Annali di Statistica. Sulle variazioni di frequenza di alcuni fenomeni demografici rari. Le variazioni della mortalità da generazione a generazione in Svezia. 81 pp., 8vo. Rome, 1912. (The Author.)
La Mortalità in Bulgaria. 18 pp., 8vo. Napoli, 1912. (*Id.*)
- Mott (F. W.)*, M.D., F.R.S., &c. County of London Asylums Committee. Address on Heredity in relation to Insanity. 43 pp., 8vo. London, 1912. (Purchased.)
- Müller (Dr. E.)*. Einführung in die Statistik. 46 pp., 8vo. Leipzig, 1912. (Duncker und Humblot.)
- Müssig (Emil)*—
Preisentwicklung in der Montan-Industrie seit 1870, mit Berücksichtigung besonderer Einflüsse, gegeben durch die technischen Fortschritte, sowie durch die Politik der Einzelwirtschaft und des Staates. vii + 113 pp., sm. 8vo. 1912. (The Author.)
Preisentwicklung in der Montan-Industrie . . . 1870-1920. Large sheet, rolled. 1912. (*Id.*)
- Nogaro (Bertrand)*. Éléments d'Économie politique. Production—Circulation. vii + 388 pp., sm. 8vo. Paris, 1913. (Giard et Brière.)
- Norton (J. Pease)*, Ph.D. Stocks as an Investment when Prices are Rising. September, 1912. 16 pp., 8vo. 1912. (The Author.) 2 copies.
- Passy (Louis)*. Histoire de la Société Nationale d'Agriculture de France. Tome 1. 1761-93. viii + 470 pp., 8vo. Paris, 1912. (M. Louis Passy.)
- Pearson (Karl)*. Attempt to correct some of the misstatements of Sir Victor Horsley, F.R.S., &c. 8vo. 1911. (Purchased.)
- Pierson (Dr. N. G.)*. Principles of Economics. Translated from the Dutch by A. A. Wotzel., vol. 2. xxiii + 644 pp., 8vo. 1912. (Macmillan and Co.)
- Pigou (A. C.)*. Wealth and Warfare. xxxi + 493 pp., 8vo. 1912. (*Id.*)
- Pissargewsky (Mlle. Lydie de)*. Note sur les Recensements de divers pays. 24 pp., 8vo. Nancy, 1912. (The Author.)

(d) **Authors, &c.—Contd.**

- Poincaré (H.)*. Calcul des Probabilités. Rédaction de A. Quinet. 2^e edit. 334 pp., Svo. Paris, 1912. (Purchased.)
- Poole (Reginald L.)*. The Exchequer in the twelfth century. The Ford Lectures delivered in the University of Oxford, 1911. xi + 195 pp., Svo. Oxford, 1912. (The Oxford University Press.)
- Porter (G. R.)*. Progress of the Nation in its various social and economic relations from beginning of Nineteenth Century. A completely new edition revised and brought up to date, by F. W. Hirst, Editor of "The Economist." xv + 735 pp., Svo. London, 1912. (Purchased.)
- Pratt (Edwin A.)*—
Agricultural organisation: its rise, principles and practice abroad and at home. xii + 259 pp., Svo. London, 1912. (P. S. King and Son.)
The State railway muddle in Australia. viii + 164 pp., Svo. London, 1912. (Mr. Murray.)
- Pralo (Jacques)*. Les Anarchistes. Histoire des Partis Socialistes en France. No. 10. 84 pp., Svo. Paris, 1912. (Marcel Rivière et Cie.)
- Raffalovich (Arthur)*. Le Marché Financier. 21^e vol. 1911-12. Année Economique et Financière 1911-12. Svo. Paris, 1912. (M. Félix Alcan.)
- Robertson (W. A.)*. Combination among Railway Companies. 105 pp., Svo. 1912. (Constable and Co.)
- Rosenrad (C.)*. Table comparing Imports and Exports of Great Britain, Germany, France, Austria-Hungary, Belgium, Italy, Russia, and United States of America, Japan and Argentine for first six months of 1912 with same period of 1911. 1a. sheet. (The Compiler.)
- Rumpf (Dr. Th.)*. Arzt und R.V.O. Der Arzt und die deutsche Reichsversicherungsordnung. 114 pp., Svo. Bonn, 1912. (Purchased.)
- Samuels (Arthur Warren)*. Home Rule Finance. An examination of the Financial bearings of the Government of Ireland Bill, 1912, with foreword by the Rt. Hon. Sir Edward Carson, M.P. 334 pp., Svo. Dublin, 1912. (Simpkin, Marshall and Co.)
- Sarognan (Franco)*. La distribuzione dei redditi nelle provincie e nelle grandi città dell' Austria. 52 pp., Svo. Trieste, 1912. (Museo Commerciale di Trieste.)
- Schmidt (Arno)*. Statistics of Consumption of Cotton for year ending August 31, 1912, and of Stocks of Cotton in Spinners' Hands on August 31, 1912. 20 pp., Svo. 1912. (The Compiler.)
- Schylbergson (Emil)*. Finlands Hypothekenverein. Ein geschichtlicher Überblick über die Fünfzigjährige Tätigkeit des Vereins 1861-1911. (Ins Deutsche Übertragen von Johannes Ohquist.) 121 pp., sm. 4to. Helsingfors, 1911. (The Finlands Hypothekenverein.)
- Scott (William Robert)*. The Constitution and Finance of English, Scottish and Irish Joint-Stock Companies to 1720. Vol. 1. General Development of the Joint-Stock System to 1720. lvi + 488 pp., Svo. 1912. (The Cambridge University Press.)
- Serin (Ludwig)*. Deutschlands Kulturausgaben. Die Bildungsausgaben im Deutschen Reichs, seinen Gliedstaaten, Gemeinden und höheren Kommunalverbänden, ihre zeitliche Entwicklung und räumliche Verteilung. Eine finanzstatistische Untersuchung. 183 pp., Svo. Berlin, 1912. (Puttkammer und Muhlbrecht.)
- Sinrel (Rudolph)*. Statistische Übersichten zur Wirtschafts. und Verkehrskunde. 143 pp., Svo. Wien, 1912. (Alfred Hölder.)
- Snellman (G. R.)*. Statistics of Estates, mortgaged in Finlands Hypoteksforening from 1861 to 1910. Compiled by request of Directors of the Union. 347 pp., 4to. Helsingfors, 1912. (Finlands Hypoteksforening.)
- Srb (Jac. Johann)*. Die Umgangssprache als Mittel zur Verstärkung des nationalen Besitzstandes in den Ländern der böhmischen Krone insbesondere und in Oesterreich im Allgemeinen. Eine Antwort an Prof. Dr. H. Rauchberg. 119 pp., sm. Svo. Prag, 1909. (The Narodni Rada Ceska, Prague.)

(d) **Authors, &c.—Contd.**

- Steechele (Johann)*. Über die Bewegung der Landwirtschaftlichen Güterpreise in der Oberpfalz 1900 bis 1910. Zugleich ein Beitrag zur Frage der Beziehung von Bodenpreis und Schutzzoll. 147 pp., Svo. Munich, 1912. (The Author.)
- Stückloff (Georges)*. La Fraction Social-Démocrate dans la troisième Douma. 88 pp., Svo. Paris, 1913. (M. Rivière and Co.)
- Taris (Étienne)*. La Russie et ses Richesses. 252 pp., sm. Svo. Paris, 1912. (Pierre Roger and Co.)
- Turney (R. H.)*. The Agrarian Problem in the Sixteenth Century. xii + 464 pp., Svo. 1912. (Longmans, Green and Co.)
- Thomson (Mary Horner)*. Environment and Efficiency. A study in Records of Industrial Schools and Orphanages, with preface by J. Randal Harris. (Birmingham Studies in Social Economics and Adjacent Fields.) 100 pp., Svo. 1912. (*Id.*)
- Toke (Leslie A.)*. The Housing Problem. Catholic Studies in Social Reform. No. 3. 63 pp., Svo. London, 1912. (P. S. King and Son.)
- Talle (Carlo)*. La Lotta per l'Esistenza. Brevi note sulla teoria economica della popolazione. 119 pp., sm. Svo. Verona, 1912. (The Author.)
- Vanderelde (E.)*. La Coopération neutre et la Coopération socialiste. 226 pp., Svo. Paris, 1913. (Félix Alcan.)
- Walshe (Robert)*. The Principles of Industrial Economy illustrated by an Enquiry into the comparative benefits conferred on the State and on the Community by Free Trade and Fair Trade or Moderate Protection. xiv + 257 pp., Svo. 1912. (P. S. King and Son.)
- Ward (Colonel B. R.)*. The Military Policy and Institutions of the British Empire. 11 pp., Svo., 1912. (The Organisation Society.)
- Watney (Charles) and Little (James A.)*. Industrial Warfare. The aims and claims of Capital and Labour. 353 pp., Svo. London, 1912. (Mr. John Murray.)
- Webster (Francis)*. A consideration of some of the causes affecting Prices and Wages during the last forty years. 2 pamphlets, Svo. 1912. (The Author.)
- Westall (George)*. Inland cruising on the Rivers and Canals of England and Wales. 263 + xxiii pp., sm. Svo. London, 1908. (The Author.)
- Wolf (Dr. Julius)*. Der Geburtenrückgang. Die Rationalisierung des Sexuallebens in unserer Zeit. xv + 253 pp., la. Svo. Jena, 1912. (Purchased.)
- Wolff (Dr. Emil)*. Lohnsystem und Löhne in der Brauindustrie Tarifverträge. Eine Abhandlung über moderne Lohnprobleme und Lohnpolitik. viii + 168 pp., Svo. Berlin, 1912. (Carl Heymanns.)
- Wolff (Henry W.)*. Co-operation in agriculture. 378 pp., Svo. London, 1912. (P. S. King and Son.)
- Zeraes (Alexandre)*. Le Socialisme en 1912. (Conclusions et Annexes.) Histoire des Partis Socialistes en France. No. 11. 101 pp., 8vo. Paris, 1912. (Marcel Rivière et Cie.)
- Žižek (Dr. Franz)*. Soziologie und Statistik. 47 pp., Svo. München, 1912. (Duncker and Humblot.)
- Concentration des Entreprises industrielles et commerciales. By A. Fontaine, L. March, P. De Rousiers, F. Samazeuilh, A. Sayous, G. Veillat, P. Weiss. 270 pp., sm. Svo. Paris, 1913. (M. Félix Alcan.)
- Lectures on British Commerce, including Finance, Insurance, Business and Industry. By Right Hon. Huth Jackson, G. Armitage-Smith, Robert Bruce, C.B., Douglas Owen, W. E. Barling, J. J. Bisgood, Allan Greenwell, James Graham. With preface by the Hon. W. Pembr Reeves. xvi + 279 pp., Svo. London, 1912. (Sir Isaac Pitman and Sons, Ltd.)
- Lombard Street. Notes prepared by Royal Insurance Company on occasion of opening their new building in Lombard Street, May, 1912. 8vo. 1912. (The Royal Insurance Company, Ltd.)
- Seasonal Trades, by various writers, with an introduction by Sidney Webb. Edited by Sidney Webb, LL.B., and Arnold Freeman, M.A. x + 410 pp., Svo. London, 1912. (Constable and Co.)

(e) **Societies, &c. (British).***Royal Society of London—*

Record of the Royal Society of London. 3rd edition, entirely revised and rearranged. La. 8vo. London, 1912. (The Society.)

Signatures in the First Journal-Book and Charter-Book of the Royal Society, being a facsimile of signatures of founders, patrons, and fellows of the Society from 1660 down to the present time. La. fol. London, 1912.

(*Id.*)

University College, London. Catalogue of Periodical Publications, &c., in Library of the College. 269 pp., sm. 4to. 1912. (The Librarian.)

Co-operative Union, Limited. 44th Annual Co-operative Congress, Portsmouth, 27th-29th May, 1912. 8vo. 1912. (The Union.)

International Free Trade League. The Burden of Protection. An international repudiation of the gospel of artificial scarcity. July, 1912. 125 pp., 8vo. 1912. (P. S. King and Son.)

Land Values. Fifth Annual Report of United Committee for Taxation of Land Values. 1911-12. 91 pp., 8vo. 1912. (The Committee.)

Liverpool Economic and Statistical Society. Transactions. Sessions 1910-11 and 1911-12. Report, Rules and List of Members, &c. 8vo. 1912. (The Hon. Secretary.)

Tariff Commission. Reciprocal trade arrangement between Canada and the West Indies. 28 pp., 4to. London, 1912. (The Commission.)

Catalogue of Parliamentary Papers 1901-10. Supplement to Catalogue of Parliamentary Papers, 1801-1900. 4to. 1912. (P. S. King and Sons.)

The Ideal Calendar and the Practical. A consideration of various proposals. 14 pp., 8vo. 1912. (The Australian Mining Standard, Melbourne.)

Year-Book of Social Progress for 1912. Summary of recent legislation, official reports, and voluntary effort, with regard to welfare of the people. viii + 617 pp., sm. 8vo. London, 1912. (T. Nelson and Sons.)

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*On the Use of the THEORY of PROBABILITIES in STATISTICS
RELATING to SOCIETY.*

*The PRESIDENTIAL ADDRESS of PROFESSOR F. Y. EDGEWORTH, F.B.A.
DELIVERED before the ROYAL STATISTICAL SOCIETY, DECEMBER 17
1912.*

MOST of those of whom I am the unworthy successor have signalised their entrance on the office of President by applying statistics to some problem of conspicuous practical interest. It was thus that Giffen, in 1883, exhibited the progress of the working classes during the preceding half century. So Caird discoursed on the condition of agriculture, Goschen on the distribution of incomes, Fowler on municipal finance. And, not to multiply distinguished instances, my immediate predecessor brought to bear on the problems of pauperism the statistics which he had assisted in compiling as a member of the Royal Commission on the Poor Law. All these, with a practical sagacity which I cannot hope to imitate, have fulfilled the purpose of our Society as laid down by its founders: the ascertaining and bringing together of those "facts which are calculated to illustrate the conditions and prospects of Society." They also, I think, have served that purpose who, with Newmarch, have been content to prospect and report upon methods of statistical science. These are the only precedents which I can attempt to follow. I follow at a great distance. For whereas Newmarch, in his inaugural address on the progress and present condition of statistical enquiry (1869), ranges over *eighteen* "fields of statistical research" which in this country must require early attention, I confine myself to this eighteenth and last division: "the investigation of the mathematics and logic of statistical evidence; that is to say the true construction and use of averages, the deduction of

"probabilities." The purport of the enquiry which Newmarch thus prescribes is more fully brought out by Dr. Guy, when referring in his inaugural address, a few years later, to "the principles of the numerical method of the logic of large numbers," he complains of "the hitherto imperfect treatment of the principle involved in the known reproduction year by year of like figures." No serious attempt, he says, has been made to place this matter before us in its true light and in all its fulness. The reproach made by Dr. Guy has at length in our day been removed by some of the more recent contributions to the *Journal*, in particular those of Mr. Bowley and Mr. Yule. But there is perhaps still room for some additional observations *in pari materia*.

Before entering on this abstract enquiry there are some concrete statistics relating to the history of our Society during the past session which it devolves upon me as President to communicate. The death rate among our Honorary Fellows has, I regret to report, been considerable. The loss of Levasseur alone would be great and irreparable. Since June of last year the Society has also lost Dr. Emil Blenck and Dr. Enrico Raseri. Among other losses by death is included that of two past Presidents of the Society, the Earl of Onslow, President in 1905-06, and Sir Francis S. Powell, President in 1904-05. By the death of Mr. A. H. Bailey the Council have lost one of their oldest and most respected colleagues.

Turning from losses to gains, it is satisfactory to be able to record a steady increase in the number of Fellows since 1909. The number of Fellows now on the Society's books is greater than in any year since 1906; but I think I should emphasize the opinion already expressed by the Council that in view of the widely extended interest in statistics the membership of the Society is still much below the number that might reasonably be expected. The extension of the Society's usefulness can, and should, be fostered by the general body of Fellows; and it rests with them, as well as with the Council, to ensure that the advantages which the Society now offers to those interested in statistical work are more widely known and appreciated.

It is pleasant to report that there is no falling off in the quality of our work. The Session has been a most successful one, not only as regards the character of the papers read, but also as regards the interest and value of our discussions.

In connection with the work of the Session we may look back with particular satisfaction upon the work done by the Special Committee on Infantile Mortality which came under discussion at

the last Ordinary Meeting. Acknowledgment has already been made of the indebtedness of the Council to Dr. Dudfield and his colleagues, but I am glad to avail myself of this opportunity of expressing my personal appreciation of a statistical task so ably and conscientiously performed.

I cannot conclude this brief retrospect without voicing what is, I believe, the general feeling that our Society has been singularly fortunate during the past two Sessions in having possessed in Lord George Hamilton a President whose association with our activities has been a constant example and stimulus. We recall with satisfaction and gratitude the valuable services which he rendered to the Society not only at its Ordinary Meetings, but also on the Council and Committees.

I now return to the consideration of the subject which has been announced.

1. The use of Probabilities in Statistics relating to human affairs may properly be introduced by the use of the theory in physics. For as there is not one sort of arithmetic for social and another for physical phenomena, so the principle of Probabilities is essentially the same in these two regions. That principle may best be discerned and recommended by considering its manifestations in the more abstract and better accredited department of science. It was not without reason that Quetelet writing to Farr as to the conduct of the fourth International Congress "insists strongly that in this "country the scientific element of statistics should be developed in "all the sections so as to maintain its early alliance with the strict "sciences through the Calculus of Probabilities." The connexion between Probabilities and the strict sciences has become much closer since the days of Farr and Quetelet. Throughout the extensive part of Nature in which matter assumes the form of a gas, physical laws are presented as the average result effected by many miniature masses rushing hither and thither at random. Thus the pressure of a compressed gas, air for instance, against the interior surface of the vessel by which it is confined is accounted for by the force of the blows delivered by the molecules of the gas as they dash against the resisting barrier. The mixture of two gases which occurs when a partition between them is removed is likewise explained as a consequence of random movements and collisions. In the authoritative words of Maxwell "the constancy and uniformity of "the properties of the gaseous medium is the direct result of the "inconceivable irregularity of the motion of agitation of its "molecules." Those of the ancient philosophers who sought the origin of things in an atomic chaos were not so mistaken as they

appeared to the defenders of common sense. A large part is really played in nature by the random rush of clashing atoms—

“*Innumerabilibus plagis vexata per aevum.*”

Nor are we concerned only with *atoms* as understood by the modern chemist, the comparatively large bodies which by their combination form the still larger *molecules* of air and water and less familiar substances. Also the thousands of much smaller particles or *corpuscles* into which each of those atoms is presumably removable are amenable to statistical treatment. The random flight of so-called “alpha” particles from “radio-active” substances presents some analogy to the departures from this life occurring in a population subject to a constant mortality.

In short, Statistics reigns and revels in the very heart of physics. “Probability-uniformities” are placed by Dr. Venn, in his masterly treatise on the modern material logic, as only one among six kinds of uniformity. But the most recent science suggests that this one is destined to swallow up many of the others: that sequences which now pose as laws of nature, co-existences which now seem ultimate facts, may one day prove to be the average outcome of movements in the invisible world of atoms and corpuscles.

Nor is it to be supposed, because the number of the constituents which go to an average in this kind of statistics is often exceeding great, that, therefore, the “average regularity” differs not only in degree, but in kind, from that which the statistical practitioner experiences. It is true that the multitudinous thud of trillions of molecules against the sides of an enclosing vessel presents itself to the senses as a single simple fact—the phenomenon of pressure. But theory suggests that if we could have a microscope sufficiently powerful to observe the motions in more detail the irregularity characteristic of statistics would appear. Experiment confirms this suggestion. M. Perrin has arranged granules (of “mastic” or other suitable substance) such and so small that floating in a liquid they are not uniformly affected by the impulse of impinging molecules. Struck in different places with different degrees of force they are driven hither and thither with varying velocities. While small enough to be thus affected, the granules are large enough to be seen through a microscope thus behaving like gigantic molecules. M. Perrin happily illustrates the action of invisible molecules on visible granules by the tossing of a distant ship, due to ripples not visible at a distance.

Moreover, in the interior world of corpuscles it has proved possible to observe and register the number of “alpha” particles which are discharged from a radio-active substance per minute or smaller unit of time. The records made by Dr. Geiger show a variation in the

number of exits from moment to moment comparable with the variation from year to year in the number of deaths occurring in a uniform population, such as males of the same age in the same occupation. These physical statistics have quite a human character.

Thus the main characteristic of statistical probability, collective constancy combined with individual irregularity—observations hovering about a mean towards which they converge—is conspicuously fulfilled in this domain of physics. Here, too, we may encounter the difficulties which beset the relation of an average to its constituents. There is first a question akin to the controversies about Free-will, which have exercised even writers on statistics. How can we reconcile the treatment of the individual constituents as fortuitous while it is believed that every particular event obeys the law of causation; as in the case of molecular motion, every single movement is determined by the strict rules of mathematical physics? Again, there is the antinomy which Buckle emphasized between the apparent freedom of the individual and the collective constancy of statistics. The regularity of the total is not simply explicable by the parts obeying rule. The truths of pure statistics have not the character of the simple propositions adduced in ordinary logic. A distinguished writer on the logic of Probabilities, Von Kries, seems even to deny that the truths which form our science are obtainable empirically. I will not follow him in attempting to describe the indescribable. I rather acquiesce in the dictum of a great mathematical writer on our subject, Poincaré: "There is here something mysterious inaccessible to the 'mathematician.'"

2. The prestige of physical science attaches not only to the fundamental principle of Probability, but also to the *law* or higher theory which is built thereon. The law which I proceed to consider is comparable in respect of quantitative precision with the laws of physics, for instance that of gravitation. As that law informs us that the distance through which a body falls (in *vacuo*, starting from rest) increases proportionally to the *square* of the time it takes to fall, or, in other words, that the time increases proportionally to the *square root* of the distance, so our law, the law of normal frequency as it may be called, informs us that the precision of an average increases proportionately to the *square root* of the number of (independent) observations averaged. But there is a marked difference, though perhaps at bottom only one of degree, between the physical law and the law of chance. The latter retains the character of Probability, and is true only on an average. If we exhibit, say, by the position of a "hand" on a dial, like that employed in weighing machines, the relation between the (square

root of the) distance and the time for several careful experiments on falling bodies, we may expect that the index will remain constantly at the same point of the dial, or at most will show only slight tremors due to imperfections of observation. But the tremors which are incidental in ordinary physics are essential in Probabilities. We can only hope for an index hovering about a point.

The allusion to errors in physical observations is more than incidental to our present purpose. Not without reason has the law which I am proceeding to consider been designated the *law of error*. For errors of observation present an important, though only a particular, example of the law with which we are now concerned. And, indeed, the theory of errors of observation is one of the principal lessons which the statistician may obtain from the practice of physicists. But as I have dwelt at length on that lesson in former numbers of our *Journal*, I now confine myself to the illustrations which are afforded by molecular physics.

It is a circumstance of momentous interest to the mathematical statistician that the law which constitutes his main implement for dealing with statistics of the visible world is accredited by its complete fulfilment in the world beyond the senses revealed by the new physics. Consider, for example, the millions of trillions of air-molecules which within this hall are rushing hither and thither in every direction and at various rates of velocity. As the railway expert may classify the trains according to their speed—express or ordinary or slow—and state the numbers of each class on any line, so by the normal theory of frequency the molecules are divided into different classes according to their velocities and the proportionate numbers of each class assigned. The commonest or most typical class is that which is characterised by a velocity of about a quarter of a mile per second. The frequency or probability of a molecule being at rest is negligible. Only one air-molecule in two millions, if I rightly calculate, has a velocity of a mile per second. And so on for different rates of velocity.

Lucretius, if he had been imbued with the new atomic philosophy, would have rejoiced to see an example so splendid of order emerging from promiscuous collisions in a molecular chaos. But he would have found the mysteries of modern science even more difficult than the recondite doctrines of Greek philosophers—"Graiorum obscura reperta"—to elucidate in Latin verse. Even into English prose it is not easy to translate the mathematical theory from its mother-tongue of symbol. Its general features need only be recalled here. It will be remembered that the normal law of frequency in its simplest form is represented by a symmetrical curve shaped much like a bow when strung. If along the string placed

horizontally there are measured from the central point (numbers of) intervals or degrees corresponding to different extents of deviation from an average, the corresponding distance at each degree of the string from the bow (the ordinate, or small strip of area, corresponding to each distance on the horizontal axis) represents the frequency with which each particular degree of deviation is apt to occur. These frequencies diminish rapidly as you move from the maximum at the centre, and die away ultimately into nothing. The metaphor of mortality is indeed appropriate in that a group of population at the central age of life, say the number of persons each aged 50 years, would in successive years diminish at an increasing rate of mortality per cent. But the analogy is imperfect in this respect that the increase in the rate of human mortality is more than proportionate to the increase of age above the central epoch. Whereas the characteristic of our curve is that the diminution (per cent.) of the frequency (represented by the ordinate of the curve) is exactly proportional to the distance from the centre.

To exhibit the fulfilment of this law in a molecular chaos let it be allowed in framing a model to make some alteration of the dimensions. First let us leave out altogether the *third* dimension and consider only movements of molecules on a plane. Also let us increase their dimensions some hundred million-fold so that the magnified bodies may be about the size of a billiard ball. Let them, also, for convenience of enunciation, be all of the same shape; all equal and perfectly elastic balls. We are then to conceive trillions of such balls rushing hither and thither with repeated collisions over a perfectly smooth billiard-table of immense extent with perfectly elastic cushions. Under such conditions the velocities of the billiard balls will be distributed according to the normal law of frequency.

The fulfilment of the law may be discerned most clearly by considering the velocity of a ball moving in any direction, say south-west to north-east, as resolvable into two component velocities, one in the direction south to north, the other in the direction west to east. Thus, if the sides of our (rectangular) billiard-table lie east to west and south to north (parallel to lines of latitude and longitude) the velocity of any ball moving in any direction, that is the distance that it would move if unimpeded in a second (or other unit of time), may be supposed to be *projected* on the eastern side of the table. The projections might be conceived as shadows thrown by the horizontal western sun on a properly arranged screen along the eastern side of the table. It is these shadows which must directly and obviously fulfil our law. For consider the set of balls

starting at the same instant from a set of points along a horizontal line (of any length anywhere in the table). And let us suppose—a very violent supposition, certainly—that these balls can move for a second without clashing against each other, or against some other balls. Or, at least, let it be possible to represent on the screen a corresponding set of shadows moving, say, northward, from a certain starting point. The velocities of these shadows will be distributed according to the normal law. If each individual stops dead at the point which it has reached at the end of a second from the time of starting, the heap thus presented will be shaped like our normal bow. Corresponding to the highest point is the case of most frequent occurrence, namely, that of no motion, stopping still at the starting-point. Similar statements are true of the velocities resolved in a direction perpendicular to that which has been considered, say on a screen placed along the northern side of the table.

This description may seem inconsistent with the statement above made that the commonest or typical velocity of molecules (of air, in a room of ordinary temperature) was about a quarter of a mile per second. But the inconsistency is only seeming; the reference being there to actual velocities in any direction, here to velocities resolved in a particular direction. If a fountain or garden-hose playing in every direction flings water to different distances (in the same time we should have to add to make the illustration perfect) over a smooth lawn, there is no inconsistency in saying that the portion of the lawn nearest the jet receives the greatest number of drops per square inch; but that of the rings which are formed by describing circles at equal distances from each other with the origin as centre, the one which receives the most drops is at a certain distance from the centre. The square inches contained in the rings nearer the centre receive less, for much the same reason that black sheep eat less than white ones—because there are fewer of them. That proposition so interpreted would remain true up to a point even if black sheep had in fact larger appetites.

Why, it may now be asked, is this beautiful theory fulfilled by clashing molecules? The statistician naturally seeks an explanation in the causes with which he is familiar. These causes have often been described in our *Journal*, and need only be mentioned summarily now. The condition that a set of magnitudes should obey the normal law is, in brief, that each should be a simple combination of numerous independently fluctuating elements. By a simple combination is understood especially a sum or a simple average (arithmetical mean), or a weighted average, or a “weighted sum,” as we may call the *numerator* of a weighted average. For

example, the sum of 25 digits taken at random and each multiplied by $\cdot 2$ is a weighted sum, which, as shown in the Appendix, fairly well fulfils the normal law.

The propriety of the particular weighting just instanced is that it keeps the dispersion or "spread" of the compound magnitudes just the same as what it is when the number of the components is different and the weight correspondingly altered. Thus the sums of 16 digits each divided by 4, as shown in the Appendix, present the same dispersion as the sums of 25 digits each divided by 5. Generally, if it is required to put together two statistical quantities each having the same dispersion in such wise that the dispersion of the compound may be the same as that of each of the components, it is proper to form a weighted sum of the two components with factors, such that the sum of their squares is equal to unity. Any number of such factors can be obtained from well-known (trigonometrical) tables; for instance, $\cdot 5$ and $\cdot 86602$. .

This principle may be employed to illustrate the distribution of velocities in a molecular chaos by a fanciful distribution of property as follows:—Imagine a community numbering a million, each starting in life with a portion of gold and likewise one of silver, assigned according to some random principle of distribution. This initial distribution is then transformed by a series of—business or gambling—transactions of a peculiar type. Suppose citizen A, having initially a of gold and α of silver deals with citizen B, who has b of gold and β of silver. The result of the transaction will be that A will have a portion of gold which is a "weighted sum" of the four quantities, a, a, b, β , the weights being constructed, in a manner more particularly described in the Appendix, by the use of a pair of factors, such as the $\cdot 5$ and $\cdot 866$. . above instanced. Similar transactions are effected by other pairs of citizens. Similarly A, after dealing with B, deals with some other citizen, say M; whether M retains his initial portions, or has already had dealings, say, with N. So brisk are the dealings that soon none will retain their original portions. After thousands of transactions each one's portion of gold and likewise of silver will be a weighted sum of some thousand fortuitously distributed elements, the weighting being such as to preserve the dispersion constant.

The interpretation of this parable is not far to seek. Each pair of letters, one Roman and one Greek, stands for the two velocities—in the directions south to north and west to east—into which the velocity of a particular molecule, as represented by one of our billiard balls, may be resolved. The velocities of a second ball, with which this first collides, are similarly represented by b and β . The result of the collision will depend not only on these velocities but

also on the manner of their encounter, whether they meet full tilt or only graze each other. The velocities being assigned, this datum will be obtained when the direction of the line joining the centres is known. Suppose, for instance, that line to make an angle of 30° with the horizontal line from east to west; then the factors just now mentioned, namely, $\cdot 5$ and $\cdot 866$. . would be appropriate. There will, of course, occur every variety of (possible) factors in the course of indefinitely numerous collisions.

But it should be remarked that these factors do not constitute so many independent elements; since, given the initial velocities, all the subsequent factors (or inclinations of lines joining centres at moments of contact) are theoretically given implicitly. If we start with a trillion molecules, we have *only* two (or in three dimensions, three) trillion *independent* initial velocities. The velocities after a quadrillion collisions would not *perfectly* fulfil the conditions of the normal law. There would be a certain *interdependence* in the contributory causes. There would, strictly speaking, be fulfilled not so much the normal law of frequency, as the more comprehensive "law of great numbers" which has been described in our *Journal*. But, I think, it would be a long time before the difference would be noticed. Nor would the fact, undoubtedly inconsistent with the *perfect* normal law, that no one molecule ever takes on more than the entire energy of the system (!) force itself practically into notice. With these slight reservations, it is deducible from the theory of Probabilities that the velocities in a molecular chaos will be distributed according to the normal law of frequency.

The simplicity of this deduction contrasts somewhat suspiciously with the stupendous demonstrations offered in the treatises on the Kinetic Theory of Gases. Nor would I claim for Probabilities more than the position of a buttress to a construction which must be rested mainly on a mechanical foundation. Indeed, when we consider the colossal substructures employed by the mathematical physicists, the thought occurs that the buttress itself may partly rest on that foundation; that the principles of Probabilities owe something to the principles of mechanics which rule the movement of molecules, which underlies the phenomena of chance.

But whatever the corner-stone and ultimate foundation, there can be no doubt about the stability and splendour of the edifice. There can be no doubt that the leading law of probabilities derives added validity and majesty from its connection with molecular physics. With something of the confidence inspired by physical science we turn to the applications of the law in statistics relating to society.

3. In the first example which I adduce the normal law is generated by exactly the same process as that which I have

employed to illustrate a physical theorem, namely the random selection of digits from a table of logarithms. I refer to the specimen of the method of sampling given by Mr. Bowley in his Presidential Address to the British Association in 1906. By the use of random digits Mr. Bowley selects a sample of 400 from a set of statements as to the percentage yield of different investments numbering nearly 4,000. From the sample he obtains with adequate accuracy the average yield of the investments, and the proportionate numbers or frequency of different classes of investment divided according to the amount of yield. Mr. Bowley allows me to cite (in my Appendix) another instructive experiment in sampling which he has more recently performed. Mr. Bowley rightly anticipates much saving of trouble from the use of such methods: "There is no need to make a house to house visitation to learn the conditions of a district; it is sufficient to enumerate the houses, to choose a certain proportion at random and investigate carefully the state of their inhabitants."

It must ever be remembered that the conclusions obtained by the method of sampling at its best are only probable; and that the improbable will sometimes occur. Mr. Bowley had an experience of this sort. For whereas from his sample of 400 it was to be expected that the percentage of investments having a yield between 8*l.* and 10*l.* 19*s.* 9*d.* was 7.25; in fact (the whole set of nearly 4,000 having been examined) the percentage number of this class proved to be only 3.8. The improbability of such a divergence between theory and fact is calculated by Mr. Bowley to be about the same as that of drawing two named cards from a complete pack: that is, very considerable. It should be observed, however, that the probability thus calculated relates to the occurrence considered as a single event. Whereas, when there are several trials, as in the case before us there were several percentages distinguished, the probability of failure in some one trial becomes serious. If you go on exposing yourself to risk, you must expect to get hit. This is the rationale of the "paradox" adduced by De Morgan in his *Budget*: that in the expansion of the constant π the number of times that the digit *seven* occurs differs from the number of times which is *a priori* probable (the total number of digits in the expansion under observation divided by 10) to an extent which cannot be accounted for by mere chance. As Dr. Venn has observed, the probability of the occurrence is not simply the probability of drawing from an urn in which balls of ten different colours are mixed up in equal proportions a sample in which the proportion of balls of a *particular assigned* colour differs to a specified extent from the expected proportion, one in ten; but the probability that *some one* (at least) of the colours should present

that discrepancy. When, as in the case now before us, the numbers of balls of each colour—the numbers of investments in each of the classes into which the sample is divided—are given, it is proper to apply Professor Pearson's beautiful criterion in order to determine the (im)probability of the composite event. Applying the criterion to Mr. Bowley's sample of 400 I find that nothing very unexpected has occurred. The *a priori* odds against the occurrence are about one to twenty; the probability is rather greater than that of drawing a black king (spades or clubs) from a pack of cards. The moral seems to be that we may obtain from samples a general outline of the facts—often sufficient for the initiation of a project like that of Insurance—rather than the features in detail.

A model of sampling less perfect in theory but closer to practice is afforded by some Norwegian statistics which have been marshalled by Dr. Kiär. A sample numbering 11,427 of statistics relating to the income and property of male persons at different ages was taken from the results of the Norwegian census, by three successive operations of more or less perfectly random sifting. First, certain localities were fixed on, apparently rather according to some official classification than by a genuinely random process. Then, as representative of persons at different periods of life, those whose age fell just between the round numbers 15, 20, 30, 35 . . ., that is, persons of the ages 17, 22, 27, 32 . . ., were selected. The initial letter of the name formed a third basis of selection.

There is generally a weak point in methods of sampling other than the most abstract; but, prior to experience, it is difficult to say where the point will be. In the example before us it might have been expected that the first step would prove treacherous. The third also, sampling by the initial letter of names, would justly be suspected in some countries—in the lands of the "M's" or the "O's." In fact, however, it seems that doubt attaches chiefly to the *second* operation, for the reason, if I understand rightly, that, as people advance in age, they are more and more apt to return for their age a round number, such as 45 or 50, rather than the intermediate 47. Accordingly the numbers of persons at intermediate ages, which are taken as typical in the sample, are apt to be unduly thinned at the later as compared with the earlier ages.

In spite of these imperfections, a very good result seems to have been obtained, as I infer, by comparing many of the percentages deduced from the sample with the actual figures of the census. Applying the Pearsonian criterion to several tables, I find the results to be so good that only about once in a thousand times could one expect a better result from ideally perfect sampling. To

the statistical practitioner the following tests will perhaps be more satisfactory. Out of *fifteen* figures obtained as the percentages of the population in towns, married or unmarried, at different ages, I find that in the case of *eleven* the difference between the true and the calculated figure is less than 5 per cent. of the true figure; there is *one* error of just 5 per cent.; *two* errors between 10 and 20 per cent., and one just above 20 per cent. The distribution of the rural population, married and unmarried, at different age periods, is given with nearly equal accuracy by the sample. Out of *sixteen* figures (omitting one for which the figure given by the census was 0, and accordingly the 1 given in the sample might be construed as showing an *infinite* relative error!) I find that *eight* show an error less than 5 per cent. of the true figure; there are *six* errors between 10 and 20 per cent., and one above 20 per cent. It must be remembered that these errors are per cent. of quantities which are themselves small percentages of the total populations. Other tables afford similar comparisons.

The worth of the sample is confirmed by its agreeing, when comparable, with a second sample taken, as I understand, with a more directly practical purpose connected with Insurance. The need of such a method for the purpose in hand is strongly suggested by the number of questions, some fifty, as to occupation of father, expenditure on food, fuel, clothing, &c., number of days lost by sickness and so on. It would be expensive and probably nugatory to ask all these questions in a general census.

The method of sampling under the designation of "The Representative system" appears to be a permanent institution in Norway. Dr. Kiär, the distinguished Director of the Statistical Bureau at Christiania, writes: "This method has according to our experience given very good results, and we have thereby acquired valuable statistical information which it would probably have been impossible to obtain in any other way." An important safety appliance is obtained by checking, or more exactly "controlling," the results of the sample by the complete statistics with respect to some of the heads which admit of this test.

Altogether, these statistics appear amply to support the case for sampling, as ably maintained by Dr. Kiär at the meeting of the Fifth International Statistical Institute at Berne. His opponents could only object that the practice was very dangerous—especially, added Dr. Mayr, in view of the proclivities of the mathematicians who prefer calculating to observing. The danger attending mathematical machinery must frankly be admitted. But there should be balanced against it not only the saving of expense, but also the greater accuracy which may be attainable when elaborate questions are put

to a select few rather than to the general population. The limited number, as Professor Schmoller, quoting Hesiod, told the Institute, may be "better than the whole."

The danger of dealing with samples according to mathematical rules is particularly great when the samples are not, as in the preceding examples, selected by a (more or less) random process from a given set of statistics; but the samples are the given statistics considered as specimens of an indefinitely larger set to which the statistics belong, a logical class rather than a particular multitude. For instance, suppose the subject in hand to be the proportion between married to unmarried men at a certain period of age. It is one thing to take the figure obtained by a carefully instituted sampling as representative of the true proportion given by a census (actual or potential); it is another matter to take the figures given by a census as representative of the relation at different times and places. Not only is there now the usual hazard attending the inductive leap from the known to the unknown; but also there is not the same security that the conditions of good sampling have been complied with. Even in the best constructed urns, as Mr. Yule has reminded us, the balls may not behave in perfectly random fashion; those of a particular colour may be more polished in such wise as to evade the hand of the operator. Very frequently the balls which represent concrete phenomena are apt to be stuck together, so that the number of independent causes, the true n of the normal formula, is not what it appears to be, not simply the number of balls. Neglect of this consideration has stultified many elaborate calculations of probability. Volumes have been written to recommend the use of Poisson's formulæ in medical statistics. But the cases observed in hospitals cannot, in general, be treated like so many balls drawn independently at random from an urn with a fixed (or even with a wavering) proportion of balls of different kinds. There are large common causes affecting considerable numbers of patients; for instance, the weather at different periods, or the circumstance, which may not appear in the statistics, that the character of an epidemic, whether mild or severe, is apt to affect large batches of patients identically.

I take these objections from Von Kries, one of the writers on Probabilities who may be compared with the historical school of economists as critics of classical authorities. They have no doubt performed a useful work; and a pleasant one, so far as accompanied with a sense of superiority over intellectual progenitors. But the revision of inspired originals may easily be carried too far. "To err with Plato" is sometimes preferable to the common sense of commentators. In the matter before us the condemnation of the

classical authorities requires to be softened by three extenuating circumstances.

First, the conditions requisite for the application of Laplace's, or Poisson's more general, formula (for testing the significance of differences in proportions) are more generally fulfilled than some of the critics have supposed. The fulfilment of the conditions is by no means confined to the one instance commonly admitted, the proportion of the sexes at birth. In several important classes of statistics relating to mortality the conditions seem to be adequately fulfilled. It is hardly too much to say that in the majority of statistics pertaining to social phenomena the concept of pure sortition is appropriate, provided that the number of observations with which we are dealing is not very large (as to the significance of which condition see Professor Bortkevitch's admirable article on the Applications of Probabilities to Statistics, in the *Encyclopädie der Mathematischen Wissenschaften*). Dr. J. H. Peek, of Overveen, in Holland, deserves especial mention as having empirically established the wide applicability of the *urnen-schema*, the analogy between the fluctuation of concrete statistics and that of balls drawn at random from an ideal urn. Dr. Peek has observed this character of pure sortition in (a ten-year series of) death rates of the general population at particular ages; and for other even less narrowly defined categories. Suppose that instead of considering the numbers of deaths varying from year to year the writer had considered the varying amounts of money paid on death (a fixed sum being payable at each death); evidently a comparison of calculated and observed deviations of payments from their value could equally have been employed to verify the validity of the *urnen-schema*. Such, as I understand, is the significance of certain statistics presented in Dr. Peek's paper—"On the Application of Probabilities"—read at the Congress of Mathematicians at Cambridge last August. The correspondence between the results of his "first method" (inference from the *urnen-schema*) and the second more empirical determination of the fluctuation in question is very convincing.

Judging from my own experience in this matter, partly recorded in the *Journal* for 1885—experience much less extensive than Dr. Peek's—I should say that he had been rather fortunate in his examples. Dealing with English death-rates (possibly less homogeneous than Dutch?), I only succeeded in verifying the character of pure sortition—the *urnen-schema*—for classes very much narrowed, deaths of persons at the same age in the same occupation.

Secondly, the empirical fact which has just been noticed is

corroborated by theory; the important theory due to Professor Bortkevitch that statistics relating to rare events (of which the probability is a very small fraction) are apt to fluctuate in almost perfect accordance with the scheme of an ideal urn. The theory of the matter has lately been discussed afresh by Dr. Mortara, Professor of Statistics at Messina, and he has added some new and striking empirical verifications of the theory. Some of his specimens could not have been obtained in this country; such as marriages between aunts and nephews. The event is, indeed, rare in Italy, but not unknown nor unrecorded—about two such marriages each year in Sicily, two in three years in Lombardy. The statistics fulfil with remarkable precision Professor Bortkevitch's law of small numbers.

Thirdly, even though the *urnen-schema* is not fulfilled in fact, nor expected by theory, this imperfection is not fatal to the use of the normal law as an aid to induction. Provided that the degree of imperfection—the “coefficient of divergence” (from the normal type), in the phrase of a leading writer of the subject—is ascertainable and constant, the normal law is still available, as shown in the Jubilee volume of our Society. The reasoning by which significant differences in statistics are distinguished from fortuitous fluctuations is still substantially the same.

Yet the importance generally attached to the presence or absence of the conditions proper to the urn scheme seems not to be altogether without foundation. Let me illustrate the point by a trivial example. In the volume referred to statistics as to the number of wasps going into or coming out of a nest were adduced; and a coefficient was empirically obtained for testing what differences in the rate of movement were not fortuitous, but significant of changed conditions. It was subsequently ascertained that this coefficient is exactly that which is presented on the supposition that the individuals going in and out are random selections from the large total at work. In fact the wasps dart forth with much the same regular irregularity as the “alpha” particles to which I have referred as specimens of physical statistics. Well, the foreknowledge of this fact would surely be an asset of some importance in fine reasoning as to the interpretation of the statistics. The datum gives an advantage to those statistics over the only other statistics *in pari materiâ* with which I am acquainted. I refer to the observations made by the distinguished entomologists, Mr. and Mrs. Peckham, on a large wasp's nest in Wisconsin; a record of exits and entrances kept continuously from early morning to noon one day in August, 1886. The character of normal dispersion is conspicuously absent from this record. The British communities which I have observed contrast favourably

in respect of regular movement with the more turbulent republic of the West.

I have now reached a point which marks the transition from discrete attributes to continuous quantity. The difference is very fine and of little importance so far as the working of the normal law of frequency is concerned. There is no essential difference, for example, between the use of the law in reasoning such as I have suggested about the *ratios* of the numbers of wasps issuing per minute to a certain total and the *absolute length* in inches of cuckoo's eggs, which forms the object of an elegant enquiry instituted by Mr. Latter. He proposes the questions whether the eggs of cuckoos deposited in the nest of any one species "stand out as a set apart" from cuckoo's eggs deposited elsewhere," and if so, whether they deviate in such a direction as to approximate in size to the egg of the foster parent. By the use of the normal law he ascertains that "hedge-sparrow cuckoos"—that is those who lay their eggs in the nests of hedge-sparrows—and certain other similarly defined classes of cuckoos, "do present differences marking them out as "distinct sets," and that some of them at least do differ from the main body "in the sense of the particular species of foster parent."

I have now entered on a large topic, the analogues in social statistics of the theory of errors in physics. But, as already intimated, I do not propose now to retouch that subject. The omission involves examples of sums (as well as averages) such as that which Mr. Bowley has dealt with in forming an estimate of income other than wages below the limit of exemption. Merely recognising the great lacuna which is thus made in this summary sketch, I go on to a distinct topic.

4. In the preceding examples the normal law of frequency has been manufactured by averaging statistics. In the cases now to be considered the averages, or rather "weighted sums," fulfilling the law are furnished, ready made, by the nature of things. We have already contemplated and explained a normality of this character in molecular statistics. It may be conjectured that the frequent appearance of the normal law in biological statistics admits of a similar explanation. Hereditary attributes are distributed among the members by continual crossing in the long course of generations, somewhat as resultant velocities are distributed among molecules in the course of repeated collisions.

Quetelet rather than Laplace is the path-breaker here. To Quetelet belongs the honour of having recognised the general prevalence of the normal law among the members of natural groups; and having assigned the presumable cause of that prevalence, the co-operation of numerous independent agencies. He, indeed, too

much ignored the asymmetry—inconsistent with perfect normality—which is commonly present in some degree in actual groupings. But the omission is the more excusable in that the causation assigned by Quetelet leads straight to a correction of the normal law which often suffices to make the fit satisfactory (that second approximation due to Poisson, familiar to the students of Mr. Bowley's *Elements*). Such was the position when Professor Pearson's second Contribution to the Mathematical Theory of Evolution made its epochal appearance. Though the need of the new methods was not at once universally recognised, experience and reflection have shown that Professor Pearson was rightly inspired in making a new departure. No mere development of (the hypothesis underlying) the normal law (on the lines of Poisson) is adequate to represent the variety of concrete groupings.

This series of attempts to represent natural groups by mathematical forms may be illustrated by the history of astronomy—to compare certain things with uncertain. There is first the *circle* prescribed on the authority of Aristotle as the pattern of celestial movements. The pre-eminence attached to the circle was no doubt somewhat superstitious, though, as Whewell points out, the properties of the circle are really very important, “circular “functions” being still required to represent complicated astronomical movements. The circle having failed to represent the phenomena adequately, “epicycles” are superadded with some success, corresponding to the (Poissonian) correction of the normal law. This correction proving inadequate, Professor Pearson, like another Kepler, proposes a better fitting curve, one different from, but having some relation to the normal curve, as the ellipse may be regarded as a defective circle. But, note that it is with Kepler's ellipse, not Newton's, which we have to do. *This* ellipse is not rested on a physical cause. It is at least as open, as the other statistical schemes, to the Miltonian description of the astronomical tentatives.

How, will they wield
The mighty frame! How build, unbild, contrive
To save appearances! How gird the sphere
With centric and eccentric scribbled o'er
Cycle in epicycle . . . !

The *statistical* “cycle” and “epicycle” have indeed an advantage over other constructions, in that their forms are deducible from a known cause. Unfortunately the cause is not always present! But the “ellipse” only claims to “save appearances.” It is not rested on a foundation of physical cause; in this respect recalling Bacon's complaint against the Copernican theory.

The following hypothesis, however, may be lent to the Pearsonian method. As a perfectly chaotic mixture of agencies results in the normal law of frequency, and a less perfect chaos, in the generalised form which has been described in our *Journal* as the "law of great numbers"; so in the gradual inroad of law upon chaos, in the scale of fortuitousness, there must be a stage characterised by forms bearing still some resemblance to the normal type, but with features considerably defaced—a deformation much greater than that of the aforesaid "generalised" law. For example, the three stages, in reverse order, might presumably be presented by a mixture of gases working down from a violent initial disturbance to the normal state. The Pearsonian construction seems well calculated to express this sort of deformation.

But on this hypothesis it occurs that some other deformation of the ideal "circle"—some *oval* other than the "ellipse"—may be equally qualified to save appearances. A variant of this character is suggested in a Paper contributed to the Statistical Section of the Congress of Mathematicians at Cambridge this year. I cannot pretend to be an impartial judge in this matter. I will only observe that the issue is not so much a question of right, as of expediency, especially in the way of saving trouble. The new construction comes not to destroy, but to fulfil Professor Pearson's theories. For example, it confirms the rule which he gives as to the relation which commonly prevails (in skew groups) between the different kinds of average—the mode, the median, and the mean.

5. Passing from *curves* to variation in two dimensions, normal *surfaces*—of which a perfect specimen has already been presented in relation to molecular physics—I remark that we have here a new departure, a higher stage, in so far as a fresh instance is here presented of an exact quantitative *law* governing the phenomena of chance. I refer, of course, to the *ratio* or *right line* which forms the measure of so-called regression or correlation. To Galton belongs the honour of having first discerned the statistical significance of regression. A debt is also due to Professor Pearson for having pointed out the best method of determining the coefficient which measures correlation between two organs or attributes. It deserves attention that he obtained this result by a stroke of Inverse Probability, a method of reasoning which narrow-minded critics of the classical authors are wont to decry.

I need not dwell on the properties of normal correlation, as they have been fully elucidated by Mr. Yule in our *Journal*. I will only offer a few remarks on some declensions from the pure normal type which often occur in practice.

First suppose that—other things being in order—the statistics do

not perfectly fulfil the normal law, but, on the contrary, are somewhat “skew.” I hope that practical statisticians will give a trial to the methods of representing such groups which have been proposed in the Paper already referred to with reference to skew *curves*.

Next suppose that the material is indeed normal, or would be if it were perfectly measured, but that perfect measurements are not to hand. The milder species of this defect is when a complete set of measurements is not given or is, to save trouble, ignored; as has been done with remarkable success by Dr. Maedonell with reference to anthropometry. The extrication of the required coefficient from data thus imperfect has been accomplished ingeniously and adequately by Dr. Sheppard, more generally—with signal mathematical skill—by Professor Pearson. Of more philosophical interest is the application of these methods to cases in which the defect of measurement is due to the imperfection of our faculties, as in the case of colours, which we can arrange in a scale but cannot measure numerically. Always presuming that the normal law is in a sense fulfilled, it appears possible to determine an exact quantitative correlation (between classes of persons) in respect of such unquantified attributes, as eyecolour or good temper. The practice of the classical writers on Probabilities who did not hesitate to make “moral,” in the sense of psychical, advantage a subject of calculation, seems to be countenanced by this modern art of measurement.

Now let both the defects which have been noticed be present together. Then we fall back upon a case, already considered, in which the proportion of a species defined by a certain attribute is different for different classes—as when the proportion of deaths is different for patients (otherwise similar) differently treated. How far now, in such circumstances, is it advisable to employ the term coefficient of correlation? How much will coefficients of association conduce to the practical object of curing patients? But I am aware that these are just now burning questions, and I bear in mind what Bagehot says about a controversial topic: “If you say ‘anything about the Act of 1844, it is little matter what else you say, for few will attend to it’ . . . ‘a single sentence respecting ‘it is far more interesting to very many than a whole book on any ‘other part of the subject.’” So I pass on to a final topic.

6. I cannot conclude without adverting to one of the principal social uses of Probabilities, the application of that calculus to the business of Insurance. Contemplating the construction of Life-Tables every Statistician must join with Dr. Farr in his tribute to “the illustrious Halley who by his table showed that the generations “of men, like the heavenly bodies, have prescribed orbits which

"analysis can trace." But, as Dr. Farr's encomium suggests, it must be remarked that the subject is only in part within our province. For, as well observed by one of the most lucid writers on the subject, "the problem of a mortality table [*Absterbe-ordnung*]" "seems to resolve itself partly into a physical [*naturwissenschaftliches*], and partly into a Probability problem." In fact we are here on the confines of law and chance.

"Here Nature first begins

"Her farthest verge, and Chaos to retire

"As from his outmost works a broken foe."

So far as actuarial mathematics deal with laws of nature in the ordinary sense of the term excluding chance, they are not here relevant. I must not therefore dwell on the niceties of interpolation, in particular the method which seems to be much in vogue with the actuaries known as "osculatory interpolation." The "fascinating problem," as it is called by a distinguished expert, cannot here be entertained. I advert only to the problems which involve an element of Probabilities. They are mainly two, I think: the estimate of the *risk* run by an Insurance Company, and the representations of a mortality table by a law of frequency of the kind proper to Probabilities.

As to the first topic, I venture to express the opinion that for the general mathematical reader, if the expression may be allowed, the best, or at least a very good, introduction to the subject is given by two of the older writers in the Theory of Probabilities, Laplace and De Morgan. It may be remarked that Laplace's calculation of risk does not involve the assumption that deaths at different ages vary as so many balls of different colours taken from an ideal urn at random. There is only postulated the statistical constancy (not the normal fluctuation) of the proportions. De Morgan, indeed, postulates more when he deals with the probability that the proportions are liable to a certain error—a calculation proper to a special Life-Table.

The problem of "graduating" a life-table has long fascinated mathematicians. The records of experience have been "scribbled 'o'er," to repeat our astronomical illustration, with a variety of formulæ adapted "to save appearances." Especial prestige attaches to Professor Pearson's scheme for representing the data by the repeated use of his flexible formula. For the data on the confines of law and chance appear to be exactly of the kind to which his formula is specially applicable.

A similar claim may be made on behalf of a certain method practised by Mr. Hardy, which consists in so adapting or "translating" a normal curve so as to fit data which are far from normal.

The general idea—independently struck out by the author—is the same as that of the method which I have proposed; while the ingenuity and success of the application are all his own.

But I dare say that neither of the methods distinguished will be much used by the practical actuary. He will attend not to the element of chance in the phenomenon, but to the element of law—the law of Gompertz and Makeham—in favour of which there is not only fact and reason (the rationale assigned by those authors) but also convenience, the law embodying the one formula which lends itself to the ready calculation of annuities for joint lives. In fact, to parody a daring French epigram, if the law did not exist it would be almost necessary to invent one. It is allowable, at least, according to distinguished writers on the calculation of Life-Tables, to “stretch a point” in favour of the Gompertz-Makeham law.

In leaving this subject I cannot say with Laplace: “I will not dwell further on matters connected with insurance, because they do not present any difficulties.” On the contrary, difficulties which the practical details of the subject present to a layman compel me to be content with these meagre generalities.

It remains only to gather up the lessons which our rapid survey may convey.

Our first exemplification of Probabilities suggests a comparison between the uses of the higher mathematics in Political Economy and in Statistics. The connection of Probabilities with molecular physics has for the statistician the theoretical interest which the pre-eminence of the principle of *maximum* in mathematical physics generally may have for the economist. The statistician finds in the world of atoms an ideal model of that law in which he should exercise himself day and night; the economist is conducted by the theory of maxima to the contemplation of interdependent variables and all that is implied in the conception of a “margin.” But whereas these general ideas form the principal or, according to some authorities, the only contribution of the higher mathematics to political economy, the Calculus of Probabilities affords more tangible service by directing the operations of sampling. I refer especially to the artificial kinds of sampling which have been instanced. For as to the constructive samples presented by data, such as the experience of hospitals, there is reason to fear that the Calculus of Probabilities—even if supplemented by the refinements of “Association” or “Correlation”—may not prove so powerful an aid to the ordinary methods of Induction. The *independence* of the observations postulated by the calculus is too often wanting. There is, indeed, as I have noticed, a remedy for this defect. But its application, requiring a prolonged series of observations, seems

hardly available in statistics relating to society; however appropriate elsewhere, in meteorology for instance, or with respect to the *unprogressive* communities of the animal world. Human society will not stand still long enough for "coefficients of divergence" from the ideal kind of frequency to be calculated. But the attempt may be not wasted so far as it cultivates a power of dealing with figures differing in degree of accuracy and what may be called a sense of probable error, which great statisticians like Giffen seem to possess instinctively.

This remark is equally applicable to the large branch of the subject which I have been compelled to omit, the analogues of the theory of errors in physics, such as that which the construction of index-numbers may present.

The character of progress in human institutions which has been mentioned is also unfavourable to the employment of analytical curves and surfaces to represent groups of statistics. But those methods seem particularly well adapted to investigate the slower progress of biological evolution. If the term "relating to society" in our title were interpreted so widely as to include biology, more than a passing tribute of admiration would be due to the band of mathematical statisticians who under the auspices of Professor Pearson have improved the weapons of Probabilities and brought new regions under her sway. Of statistics in the narrower sense, pertaining to states and statesmen, those parts, I think, are most amenable to the new methods which are most nearly related to our physical nature—in particular vital statistics.

On the whole, I accept the practical answer which our Society gives to the question: what is the use of mathematical methods for our purposes? The general tenor of our statistical reasoning remains what it was in the days of Porter and Newmarch. But we permit an occasional outbreak of mathematics. As one of my predecessors put it: there should be once in a session a paper which no one—or hardly any one—can understand. To have had once in an age a presidential address of this character will, I hope, not seem excessive.

APPENDIX.

Appended are some notes and references relating to the above sections in the order of succession.

1. (p. 167.) Reference is made to Dr. Farr's Inaugural Addresses to the Statistical Society, 1871 and 1872. Dr. Farr observes in this connection: "This Society owes its origin to two of the foremost "mathematicians and physicists of the age on the special ground

“that they saw in statistical phenomena a wide field, beyond “expression interesting to men, under the domain of law.” Compare the resolution carried by Quetelet at the sixth meeting of the International Statistical Congress (quoted by Samuel Brown, *Journal of the Statistical Society*, vol. xxxi, p. 22).

(p. 168.) Dr. Venn’s classification of “Uniformities” is given in his *Empirical Logic*, p. 94. His view of statistical “series” in his *Logic of Chance* should be compared.

(p. 168.) M. Jean Perrin’s experiments are described in the *Annales de Chimie et de Physique*, 8^{me} Series, September, 1909; translated by F. Soddy, as *Brownian Movement and Molecular Reality*, 1910. (Compare M. Perrin’s lectures to the Royal Institute, February 24, reported in the *Chemical News* for October and November, 1912.) The Brownian movements, named from their first observer, are not to be confounded with the dancing of dust motes in the sunlight which Lucretius has described in terms singularly appropriate to the true molecular action:—

Multa videbis enim plagis ibi percita cœcis
Commutare viam retroque repulsa reverti
Nunc huc nunc illuc in cunctas denique partes.

.

Sic a principiis ascendit motus et exit
Paulatim nostros ad sensus.

(*De Rerum Naturâ*, lib. II, v. 129 et seq.)

(p. 168.) Dr. Geiger’s experiments are described in the *Philosophical Magazine* for 1910, vol. 20, p. 700.

(p. 169.) Among statisticians who have approached the problem of philosophical determinism or theological predestination may be mentioned the Prince Consort in his Presidential Address to the International Statistical Congress of 1860 (*Journal of the Statistical Society*, vol. xxiii).

The title of Von Kries’ logical disquisition is *Die Principien der Wahrscheinlichkeits-Rechnung*, 1886. See his remarks on “das “eigentlich Unempirische Princip,” p. 170, and on “Spielräume” *passim*.

2. (p. 170.) The cognate papers in the *Journal* to which reference is here made are chiefly “Methods of Statistics,” *Jubilee Volume*, 1885; “The Generalised Law of error,” 1906; “The “probable errors of frequency-constants,” 1908. Compare the contribution to (the *Bulletin de*) *l’Institut International de Statistique*, 1909.

(p. 170.) The illustration of molecular movements in two dimensions by a crowd of billiard balls is suggested by Mr. Jeans in his *Dynamical Theory of Gases*, p. 5. The same work may be referred to as illustrating the stupendous character of the received

demonstrations; the author starts his principal proof by supposing six times as many dimensions (in hyper-space) as there are molecules under consideration—presumably some trillions!

(p. 172.) The genesis of the law of error is thus illustrated by linear functions of digits taken at random. Below are forty-eight statistics, each of which is obtained as follows:—Twenty-five digits are taken at random from a table of logarithms, each forming the seventh place of decimals in successive logarithms, beginning with the logarithm of 101 (and ending with the logarithm of 1,300). From the sum of the twenty-five digits which go to each of the forty-eight statistics there is subtracted $112.5 = 25 \text{ times } 4.5$; 4.5 being the mean value of an indefinitely great number of digits taken at random. This difference divided by 5 (the square root of 25) forms one of the group of statistics given below; a group which ought approximately to conform to the normal error-curve of which the central point is zero and the parameter or modulus the square root of twice the mean square of deviation of random digits from 4.5; that mean square being 8.25.

Below zero, without their (negative) sign, in a descending order of absolute magnitude (not the order of occurrence):—

6.9, 6.5, 5.5, 3.5, 2.7, 2.7, 2.5, 2.5, 2.5, 2.3, 2.1, 1.9, 1.9, 1.7, 1.7, 1.5, 1.3, 1.3, 1.3, 1.3, 1.1, .9, .3.

Above zero, without their (positive) sign, rearranged in an ascending order of absolute magnitude:—

.1, .1, .1, .3, .5, .5, .7, .7, .7, .9, 1.1, 1.5, 1.5, 1.7, 1.9, 1.9, 2.3, 2.7, 2.9, 3.5, 4.9, 5.1, 5.3, 5.5, 6.5.

It may be noticed that the *Median* (the point which has as many observations above it as below it) is not, as it should be theoretically, zero, but $+ .15$. But this deviation from the theoretical value is well within the probable error which characterises the probability that if the forty-eight given statistics were really samples of a perfectly normal indefinitely large group, the observed irregularity might occur, *i.e.*, about .33.

Likewise the *Quartiles* (the two points below which and above which respectively occur a quarter of the total number of observations) are $- 1.9$ and $+ 1.6$ (half-way between $+ 1.5$ and $+ 1.7$). Whereas the theoretical deviation of each from zero is .4769 Modulus = 1.94 nearly. There is thus (in one case) a difference between the observed and theoretical value of .34, which is nothing extraordinary considering that the probable error to which the determination is liable is about .37.

So, there ought to be theoretically four-fifths of the total number, say thirty-eight or thirty-nine observations, between the

limits $+ 3.68$ and $- 3.68$ (the Deciles = $.906$ Modulus). And in fact forty of the observations lie between those limits.

The mean (deviation from zero) of the forty-eight observations taken without their signs in absolute magnitude is 2.266 ; while theoretically it should be $\text{Modulus}/\sqrt{\pi}$, i.e., 2.29 . The difference between the actual and the theoretical values is less than $.03$, the probable error, about $.05$.

Aggregates of *sixteen* digits present similar characters, but less perfectly owing to the smaller number of constituents which go to each observation. Below are forty-eight statistics, each formed from the last sixteen digits in one of the batches above described. From the sum of each set of sixteen there was subtracted 72 (16 times 4.5), and the difference was divided by 4 (the square root of 16).

Below zero in the order of magnitude :—

$5.5, 5.5, 4.75, 3.25, 3.25, 3.25, 3, 3, 2.5, 2.5, 2.5, 2.5, 2.5, 2, 1.75, 1.75, 1.75, 1.5, 1.5, 1.25, 1.25, 1.25, 1, .75, .75, .5$.

At zero, one observation.

Above zero :—

$.25, .5, 1, 1.25, 1.25, 1.5, 2, 2.25, 2.25, 2.25, 3, 3.25, 3.25, 4, 5, 5.25, 5.75, 5.75, 6.5$.

The mean deviation of the forty-eight observations in absolute magnitude is 2.5 , showing a difference from the theoretical mean, 2.29 , not enormously greater than the probable error, viz. (in the sense above explained), about $.05$.

(p. 173.) In the variant proof which is offered for Maxwell's theory of the distribution of velocities in a molecular chaos the factors u and z are, of course, to be replaced by $\sin \theta$ and $\cos \theta$. By substituting for these $\cos \alpha, \cos \beta, \cos \gamma$, the direction co-sines of any line in space, the proof may readily be extended to three dimensions.

From the similarity of the expression for the mean velocities, say, u and v in two dimensions, it is perhaps evident that the mean squares of the velocity are equal. Or this may be considered as given by the facts of pressure: as in the paper on the subject in the *Philosophical Magazine* for January, 1913. Or it may be deduced from a smaller assumption, namely, that the line joining the centres of a colliding pair of (spherical equal perfectly elastic) molecules is as likely to be in one direction as another. Let θ be the angle made with the axis of x on any occasion. Then if u_s, v_s , and u_t, v_t , are the velocities, of the two molecules before collision resolved in the direction of the axis OX , we have for U_s , the velocity of the first in the direction of the line joining the centres, $u_s \cos \theta + v_s \sin \theta$, and for V_s the velocity in the direction perpendicular thereto, $-u_s \sin \theta + v_s \cos \theta$; with corresponding expressions for the

molecule t . The velocities U_s and U_t are exchanged in consequence of the collision, and accordingly we have for u_s' , the velocity of the s molecule after collision

$$u_s' = U_t \cos \theta - V_t \sin \theta;$$

$$u_s' = \cos \theta (u_t \cos \theta + v_t \sin \theta) + \sin \theta (v_s \cos \theta - u_s \sin \theta).$$

Now suppose every variety of u and v to occur, θ retaining the particular value assigned to it; then, as by hypothesis θ is independent of the velocities, we obtain an expression for the mean value of u_s' for the particular θ in terms of the mean velocities (in the directions of the axes). Those mean velocities are, indeed, zero (the centre of gravity of the system being at rest). But not so the mean square of velocities, which, in consequence of the circumstance (deducible from the theorem in the text) that the u 's and v 's are distributed normally, and the further assumption that they are practically, though (for a reason suggested in the text) not perfectly uncorrelated, becomes *clear of products*. If then we put $[u_s'^2]$, $[u_t^2]$, &c., for mean square of velocity, and denote by $(u_s'^2)$ mean square of velocity in the direction OX of molecules colliding with line joining their centres at the particular angle θ , we have $(u_s'^2) = [u_t^2] \cos^4 \theta + [v_t^2] \sin^2 \theta \cos^2 \theta + [v_s^2] \sin^2 \theta \cos^2 \theta + [u_s^2] \sin^2 \theta$.

For example, if $\theta = \frac{\pi}{2}$, $(u_s'^2)$ reduces to $[u_s^2]$; as it evidently ought to do, since the movement in the direction OX is unaffected by such a collision. Or if $\theta = 0$, $(u_s'^2)$ reduces to $[u_t^2]$ as it ought to do, since the spheres in every such collision exchange velocities in the direction OX. Now (θ being independent of the u 's and v 's) it is proper to integrate the right-hand side of the above equation in order to obtain an expression for $[u_s'^2]$, the mean of $(u_s'^2)$ for all possible values of θ , that is the mean of $u_s'^2$ for all possible values of u . We have thus, integrating between limits 0 and $\frac{\pi}{2}$,

$$\frac{\pi}{2} [u_s'^2] = [u_t^2] \frac{1}{16} \pi + [v_t^2] \frac{1}{16} \pi + [v_s^2] \frac{1}{16} \pi + [u_s^2] \frac{1}{16} \pi;$$

$$\frac{1}{2} [u_s'^2] = \frac{1}{2} [u_t^2]. \text{---Q.E.D.}$$

By parity of reasoning it may be shown that if there are two sets of molecules, each like that above considered but with different masses, the mean square of velocity for each set will be in inverse proportion to the mass of the molecules of that set. There will be an equal partition of mean energy between the two sets.

The Calculus of Probabilities may be employed more generally to verify Maxwell's theory of the Equipartition of energy.

3. (p. 175.) Mr. Bowley's Presidential Address to Section F of the British Association is printed in the *Journal of the Statistical Society* for 1906. Here is the additional sample of the practice of Sampling which Mr. Bowley has supplied. It was required for a certain purpose

to ascertain the distribution of the population of England and Wales in rural districts, the unit being the civil parish, and the objective the density. For this purpose the civil parishes in rural districts were numbered consecutively from 1 to 12,830. Next 250 numbers were selected from logarithm tables in such a way that every number from 1 to 12,830 had an equal chance of inclusion. The parishes corresponding to the numbers were then selected and tabulated. In order to test the sufficiency of the sample, advantage was taken of a tabulation according to number of persons in a parish given in the Census, Cd. 6,258, p. 428. Here all parishes are included, but those in urban districts were subtracted. The result of the sample of 250, tabulated in accordance with the census classification and compared therewith, is as follows:—

Proportion of persons in parishes per 1,000.

	—100—	100—	200—	300—	400—	500—	1,000—
Sample.....	140	208	168	108	80	164	132
Fact.....	152	192	147	108	80	173	146

(p. 175.) De Morgan's paradox is discussed by Dr. Venn at p. 247 of his *Logic of Chance*, third edition. As to the principle, compare Cournot's *Exposition des Chances* (§ 114); with whom I may say, "Je ne dissimule pas ce qu'il y a de délicat dans toute "cette discussion." By a summary application of the principle, Dr. Venn, dealing with 708 digits, finds that the odds are reduced from the *prima facie* 44 to 1 down to 4 to 1. By the Pearsonian criterion (dealing with the 608 digits analysed by De Morgan, *loc. cit.*, p. 291) I find that the odds against the observed event occurring by chance are only 3 to 1.

(p. 176.) Dr. Kiär's exemplifications of the method of sampling are given in the *Allgemeines Statistisches Archiv*, vol. v (1879), p. 1, *et seq.*

(p. 176.) The caution required in applying the analogy of balls drawn at random from a bag to concrete statistics is well inculcated by Mr. Yule in his *Theory of Statistics*, ch. xiv. It should be observed that the "sampling" here explicitly treated corresponds to his "sampling of attributes"; while his "sampling for variables" is nearly coincident with the analogues of the Theory of Errors, which are here omitted as having been treated in former papers.

(p. 178.) The remarks in the text on the use of Probabilities in Medical Statistics are fully sustained by Gavarrret's *Statistique Médicale*, Liebermeister, and other nineteenth-century writers *in pari materiâ*.

3. (p. 179.) Dr. Peek's principal observations on the coincidence

between the combinational and physical dispersion (to use Lewis' distinction) are given in *Zeitung für Versicherungs Recht u. Wissenschaft*, 1899.

(p. 179.) The reference to the *Journal of the Statistical Society* is not—or not principally—to the paper in the *Jubilee Volume*, but to that entitled *Methods of Ascertaining Variations in the rates of Births, Deaths, &c.*, in the December number of that year.

(p. 180.) Dr. Mortara's contributions to the "law of small numbers" are given in the *Annali de Statistica*, series v. vol. 4, 1912.

(p. 180.) Mr. and Mrs. Peckham's observations are recorded in their article entitled, "Some Senses of Wasps," published by the History Society of Wisconsin, April, 1887.

(p. 180.) The "divergence" from ideal sortition ascertained by Dormoy and Lexis is, of course, not inconsistent with the fulfilment of the normal law by the *average*, with which alone we are concerned in this section (provided a sufficient number of *independent* elements go to the average).

(p. 180.) Contributions to entomological statistics will be found in the *Journal of the Statistical Society*, 1885, *Jubilee Volume*, p. 209; 1896, p. 358, *Statistics of Unprogressive Communities*, and p. 529, *Further Notes*; *Biometrika*, vol. v, *Statistics of Wasps and Bees*; where the normal character of the dispersion is pointed out.

(p. 181.) For Mr. Latter's application of the theory of observations to cuckoo's eggs, see *Biometrika*, vol. i, and vol. iv, part iii.

4. (p. 182.) "Ejus sunt viri qui quidvis in naturâ fingere, modo 'calculi bene eedant, nihil putet" is Bacon's striking description of the Copernican theory (*Descriptio Globi Intellectualis*, ch. 6); not so absurd a view, in the absence of the physical basis supplied by later astronomical science.

5. (p. 185.) The authorities on actuarial mathematics to whom I specially refer are:—

Laplace, *Théorie Analytique des Probabilités*, Book II, chap. ix, Art. 40, and context.

De Morgan, *Theory of Probabilities*, part of the *Encyclopædia Metropolitana* (sect. 146 and context and earlier relevant sections).

E. Blaschke, *Vorlesungen über Mathematische Statistik*, 1906.

G. F. Hardy, *Theory of the Construction of Tables of Mortality*, 1909.

The "method of employing the 'normal' frequency-curve to "represent the series" given by Mr. Hardy at his p. 91 *et seq.* is of a piece with the method described in this *Journal* as "translation"; at least when we "treat z as a parabolic function of t " (Hardy, *loc. cit.*)—a treatment which is, I think, recommended by simplicity and a certain affinity to Taylorian expansion.

PROCEEDINGS *on* DECEMBER 17, 1912.

THE PRESIDENT having delivered his Address,

LORD GEORGE HAMILTON said it was his privilege as retiring President to move a vote of thanks to the President for the singularly able Address to which they had all had the pleasure of listening. At the conclusion of that Address the President had quoted something which he (the speaker) was supposed to have said, viz., that it was good for the Society that once a session a paper should be read which nobody could understand. He did not go so far as that. He only suggested a paper which the vast majority of those to whom it was addressed could not understand. He had never contemplated the position that an erudite President would make an Address which he himself did not understand. He thought that was not the position on the present occasion. Professor Edgeworth had long had a well-established reputation both at Oxford and in the Society, and the Address that he had made, if at times it had got a little beyond the comprehension of a layman like himself, had enhanced that reputation. The subject seemed to him to be one which was well fitted for discussion and for the consideration of a Society such as theirs, because he thought there was nothing more remarkable than the practical use which was made of the theory of probabilities in statistics relating to Society. By means of that theory probability was evolved out of improbabilities, constancy out of irregularity, and the theory of probabilities formed the foundation of one of the largest and most successful of all commercial undertakings, namely, that of insurance. It was very remarkable that no fresh industry, no fresh field of activity was opened out by invention and science to which the theory of probabilities was not applied and with which insurance was not more or less associated. In the future, as chairman of a big insurance company, he would always be thinking whenever he signed any policies that they were based not so much on the mathematical calculations of the accountant as on the erratic motion of many trillions of molecules which were in the air, and which apparently were the foundation of actuarial calculation. He thought the Address showed that they were singularly lucky in being able to induce Professor Edgeworth to undertake the Chair for the forthcoming year. While he was certain that Professor Edgeworth would be successful in the discharge of his duties connected with the Chair, he would like to make a remark on one of the early parts of his Address. Professor Edgeworth had there alluded to the fact that he (the speaker), as President, had attended a great many meetings of the Executive Committee and the Council during the past two years. He did so because not only he took an interest in the Society, but he congratulated the Society on having on its Council and on that Committee a large number of competent persons who took a great interest in the working of the Society. Though many of them were very busy men, they were ever ready to give up some of their spare time in order to read papers, report on them, and do

everything they could to assist the development of the Society. Their President had made a brilliant start by an admirable Presidential Address, and supported, as he knew he would be, by a very able Council and Executive Committee during the next twelve months, he could confidently be congratulated both on his Address and on the commencement of a year's progress and development for the Society.

Mr. EDWARD BOND, in seconding the vote of thanks, said that Lord Courtney of Penwith should have performed that duty; he was sorry to say that he was not there, as he would have performed it much better. It gave him great pleasure, however, to have the task assigned to him, as the President and he had been friends for something like forty years, and it was pleasant for him to be able to offer to the President in public his congratulations at seeing him so worthily occupy the position in which he was placed that afternoon. But he did not think he had any other ground which qualified him for seconding the vote of thanks. He could not offer any of the shrewd suggestions or friendly comments or adequate appreciations which usually the proposer and seconder of votes of thanks were able to afford to the Society and to the person who was being thanked, because he confessed he was rather in the position of Lord George Hamilton, if he had construed his words aright, that there were portions, and large portions, of the Address to which they had listened which he was not able entirely to follow or comprehend. He had listened with veneration and admiration, but not with perfect understanding. It rather reminded him of an incident in his Parliamentary career which he sometimes recalled with amusement. He once had the honour of helping to bring before the late Duke of Devonshire, who was then head of the educational system of the country as President of the Council, a deputation of masters of middle class or secondary schools who had certain grievances and certain observations which they wished to offer to the Duke in order that a legislative remedy might be provided if possible. The Duke listened until they had finished (and they were a very long time in finishing), and when they had done he said, with that charming candour which distinguished him, "I am very much obliged to you, gentlemen, for coming here and laying your views before me. It would, perhaps, have been more advantageous if I had been able to understand all the remarks which were addressed to me; I confess I was not able to do that so thoroughly as I should have wished owing to my ignorance of the terminology employed." That was to some extent the feeling with which he had listened to Professor Edgeworth's admirable lucubration, but it did not in the least prevent him asking those present to join heartily in giving a vote of thanks to the President for the paper he had read, which he was sure was admirable, and which he, perhaps, might be able to understand if he gave a good two or three hours to it in private.

The following candidates were elected Fellows of the Society:—

E. H. Chapman, M.A., B.Sc.

G. Heinbrod.

F. A. Norman.

THE RATE OF INTEREST ON BRITISH AND FOREIGN INVESTMENTS.

By R. A. LEHFELDT.

THERE is a general impression that the interest obtained on capital exported from the United Kingdom is higher than that on home investments; but there is little exact information. The following is an account of an examination of the published records of investments.

No attempt has been made to get completeness in the totals: this is a different question. Estimates of the total British capital invested have been made; as regards foreign investments we may refer to the work of Sir George Paish, published in the *Journal*. In making such an estimate, public issues, which are only intended to repay old loans, must be eliminated, and an allowance—a very uncertain one—made for capital placed privately, must be added to the public issues. The object of the present paper being the rate of interest, these allowances were of no importance; but care was taken to examine the bulk of issues, and eliminate those which for any reason were abnormal, and would have falsified the average, such as short date bonds.

The sources of information are (i) the list of new issues in London, published weekly by the *Economist*, or monthly by the *Investor's Monthly Manual*, (ii) "Issues," published twice a year by *The Times*, and containing reprints of prospectuses that have appeared in that newspaper, (iii) the *Stock Exchange Official Intelligence*, and the *Stock Exchange Year Book*, for subsequent history of investments.

Issues are classified (by the sources (i)) into those made exclusively in London, and those made simultaneously abroad. The distinction is important as regards total British capital invested, but not as regards rate of interest. In most cases the terms of issues made internationally are similar to those made in London only. In a few cases the issue was really a foreign one, quoted on the London market more for ornament than anything else; it has then been omitted from the list.

The next classification introduced is according to size. Issues of *cash* value exceeding 900,000*l.* are called large, between 100,000*l.* and 900,000*l.* medium, and others small. [The limit of 900,000*l.* was chosen because there are very many issues of a million nominal made at a few per cent. discount.] A complete catalogue of "large issues" of the last fourteen years has been made; and certain partial catalogues of "medium issues."

Two other groupings have been made, one into "Home," "Colonial" and "Foreign"; the other into "shares" and "issues at fixed interest," the latter including preference shares when not participating in profits.

In the case of issues at fixed interest it is, of course, easy to calculate the percentage, both of interest and of redemption rights, promised to the public. (This is not the same thing as the rate paid by the borrower, on account of underwriting commissions, brokerage, &c.) It is only necessary to check this by seeing if the

promises have been kept. In case of default the average amount actually paid during the ten years following the issue has been calculated (so far as history has yet revealed itself). In some of these cases the investment has since gone to the bad altogether, in others it has recovered, so that the ten-year average taken over all the cases is not very far from the true value. Fortunately, defaults are becoming more and more rare.

For share issues, the average of the dividends paid in the first ten years has been taken. Probably investments of this kind more often appreciate than depreciate after the first decade. In the group of "large" issues, shares play a very minor part.

The method will be followed best by giving one year's statistics in some detail.

1902.

Issues mentioned in Investor's Monthly Manual (cash value).

	£
London only	140,050,000
Partly abroad	13,762,000
Total	<u>153,812,000</u>

Distribution.

	London.	Partly abroad.	Total.
	Per cent.	Per cent.	Per cent.
Large	65	84	67
Medium	31	16	30
Small	4	0	3

Small issues, of course, are not often made in more than one city. It will be noticed that the catalogue of large issues accounts for two-thirds of the money invested in the year, so that conclusions drawn from it have considerable weight. The percentage was abnormally high in 1902, but it tends to increase with the growing scale on which business is conducted.

After making certain deductions for issues not fully subscribed, the total of "large" issues comes to 97,921,000*l.*, distributed thus:—

[000's omitted.]

	Fixed interest.	Share.	Total.
	£	£	£
Home	54,040,	1,060,	55,100,
Colonial	20,597,	1,250,	21,847,
Foreign	20,974,	0,	20,974,
Total	95,611,	2,310,	97,921,

The proportion of home investments that year was very large, including, as it did, an issue of consols for 30,000,000*l.* The proportion of large share issues was even smaller than usual.

The totals are made up as follows:—

FIXED INTEREST.—*Home.*

	Cash value in 1,000's.	Rate of interest.	Value of the redemption when promised for a fixed date.
	£	Per cent.	Per cent.
London County Council	2,955	3·05	....
United Kingdom (Local Loans)	2,004	2·99	....
Imperial Tobacco Company Preference	3,000	5·50	....
Imperial Tobacco Company Debenture	1,000	4·25	....
Shell Transport Preference	1,000	5·00	....
Leeds	1,882	3·19	....
London and North-Western Railway	2,562	3·20	....
United Kingdom (Consols)	29,920	2·68	....
Peninsular and Oriental Navigation Company	Not fully	subscribed	....
Birmingham	960	3·13	....
Liverpool	970	3·10	....
United Collieries	1,000	5·00*	....
Caledonian Railway	1,861	3·47	....
United Kingdom (Local Loans)	1,986	3·02	....
British Electric Traction	Not fully	subscribed	....
London County Council	1,940	3·05	....
South-Eastern Railway	1,000	4·00	....
	54,040	3·12†	....

Colonial.

Cape of Good Hope	2,660	3·42	—0·05
Ceylon	1,323	3·18	+0·08
Natal	1,809	3·23	+0·07
Western Australia	1,537	3·41	—0·10
Burma Railway	1,200	3·13	....
Gold Coast	942	3·30	+0·07
India	1,522	2·95	—0·01
New South Wales	2,835	3·18	+0·09
Cape of Good Hope	2,939	3·13	+0·05
East Indian Railway	1,455	3·10	....
Victoria	965	3·11	+0·03
Natal	1,410	3·19	+0·06
	20,597	3·19	+0·02

Foreign.

Pará	1,276	5·68	+0·06
Baltimore and Ohio Railway ‡	4,140	3·86	—0·10
Dunderland Iron	1,000	6·00	....
Havana Electric Railway ‡	1,510	5·10	....
Bulgaria ‡	3,797	5·52	+0·04
Japan	5,104	5·00	....
Turkey ‡	2,047	4·68	+0·06
Buenos Ayres G.S.R.	2,100	3·81	....
	20,974	4·93	+0·01

* Default. Average paid for ten years = 2·00.

† Reduced to 3·07 by default.

‡ Issued partly abroad.

SHARES.—*Home.*

	Cash value in 1,000's.	Rate of interest.	Value of the redemption when promised for a fixed date.
	£	Per cent.	Per cent.
London and South-Western } Railway	1,060	3·32*

Colonial.

Charter Trust	1,250	1·82*
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* Average ten years following.

It will be noticed that the Colonial fixed interest issues are all Government stocks (including two guaranteed railways). The proportion of Government loans is always high among Colonial issues, though not usually so high as this.

The averages for fixed interest stocks are :—

	Promised.	Obtained.		Promised.	Obtained.
	Per cent.	Per cent.		Per cent.	Per cent.
Home	3·12	3·07	Colonial—home	0·09	0·14
Colonial	3·21	3·21	Foreign—home	1·82	1·87
Foreign	4·94	4·94	Weighted mean	3·54	3·51

The catalogue of large issues has been completed for the years 1888, 1893, and every year from 1898 onwards. The amounts and rates of interest are given in Tables A and B.

In studying Table A it must be remembered that, referring only to large investments, it does not represent either the totals or the distribution that would be found in a complete investigation. The amount dealt with is, perhaps, half the savings of the British people. The first point that stands out is the insignificance of shares, which do not amount to 10 per cent. of the total. Despite the growing magnitude of businesses, the public evidently do not care much for taking business risks in very large affairs. Almost the only really large share capitals are those of English, American, and Argentine railways—and in railway matters the demand for nationalisation is constantly growing. Hence one may say broadly that the money for big public works is always raised by a promise of fixed interest—that the functions of capitalist and entrepreneur are separated. Of course, if smaller concerns were included the percentage of share capital would be found much larger.

The next point to notice is the steady growth of colonial and foreign enterprises, as compared with the fluctuating amount of home investments. Colonial enterprise has gone on steadily, even when the Boer War diverted capital from its normal employment :

TABLE A.—Amount of investments in the form of issues exceeding 900,000*l.* each.
[In 1,000 £'s.]

Date.	Fixed interest.			Shares.			Total.			Remarks.
	Home.	Colonial.	Foreign.	Home.	Colonial.	Foreign.	Fixed interest.	Shares.	Grand total.	
	£	£	£	£	£	£	£	£	£	
1888.....	1,938	24,865	40,844	3,100	0	1,800	67,647	4,900	72,547	Argentine boom. Subsequent to Argentine fail- ures and Australian bank crisis.
'93.....	2,845	10,436	3,020	1,095	0	0	16,301	1,095	17,396	
'98.....	4,992	10,912	34,089	6,954	1,000	2,587	49,993	10,541	60,534	
'99.....	8,511	11,049	17,147	9,127	3,062	0	36,707	12,189	48,896	
1900.....	62,833	7,015	3,124	9,016	1,750	900	72,972	11,666	84,638	30,000,000 <i>l.</i> war loan. 60,000,000 <i>l.</i> Consols. 30,000,000 <i>l.</i> Consols. 30,000,000 <i>l.</i> Transvaal loan.
'01.....	80,994	14,449	1,994	5,425	0	3,225	97,437	8,650	106,087	
'02.....	54,040	20,597	20,974	1,060	1,250	0	95,611	2,310	97,921	
'03.....	11,743	38,905	8,633	0	0	0	59,281	0	59,281	
'04.....	27,470	22,017	22,501	0	4,430	1,000	71,988	5,430	77,418	
1905.....	24,598	30,100	38,442	0	2,302	11,452	93,140	13,754	106,894	28,000,000 <i>l.</i> Japanese. Ar- gentine Railway shares.
'06.....	11,023	13,334	30,610	2,500	4,056	6,937	54,967	13,553	68,520	
'07.....	4,850	18,532	38,025	2,500	2,137	3,760	61,407	8,397	69,804	
'08.....	21,268	34,677	55,714	0	6,090	5,740	111,659	11,830	123,489	
'09.....	3,275	44,161	50,757	0	900	5,500	98,193	6,400	104,593	
1910.....	6,994	45,632	51,002	0	3,487	12,415	103,628	15,902	119,530	Canadian and Argentine Rail- way shares.
'11.....	3,901	26,093	59,434	2,300	7,877	6,000	89,428	16,177	105,605	
1900-04	237,080	102,983	57,226	15,501	7,430	5,125	397,289	28,056	425,345	
1905-09	65,014	146,864	213,548	5,000	15,485	33,449	419,366	53,934	473,300	

TABLE B.—*Return on large investments at fixed interest (redemption value included).*

Date.	Interest promised.				Defaults.			Interest obtained.
	Home.	Colonial.	Foreign.	Mean.	Colonial — Home.	Foreign — Home.	Home. Colonial. Foreign.	
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.		
1888	4·35	3·43	5·61	4·76	-0·88	+1·26	....	Foreign, 3·49. Mean, 3·49.
'93	2·92	4·09	5·53	4·14	+1·17	2·61	{ Numerous South American	Foreign, 3·49. Mean, 3·49.
'98	2·81	3·07	3·97	3·65	+0·26	1·16	{ 1 South Ameri- can railway	Foreign, 5·09. Mean, 4·06.
'99	3·44	3·27	5·11	4·16	-0·17	1·67	....
1900	3·35	3·20	4·05	3·35	-0·15	0·70	....
'01	3·00	3·40	5·34	3·11	+0·40	2·34	....	Foreign, 4·01. Mean, 3·08.
'02	3·12	3·21	4·94	3·54	+0·99	1·82	{ Ecuador	Home, 3·07. Mean, 3·51.
'03	3·44	3·21	5·77	3·64	-0·23	2·33	....
'04	3·46	3·78	5·83	4·31	+0·32	2·37	United collieries	
1905	3·39	3·78	4·99	4·17	+0·39	1·69	....
'06	3·37	3·85	5·14	4·48	0·48	1·77	....
'07	3·61	3·99	4·90	4·51	0·38	1·29	....
'08	4·00	4·04	4·95	4·49	0·04	0·95	....
'09	3·60	3·96	4·88	4·43	0·36	1·28	....
1910	3·72	4·19	4·85	4·49	0·47	1·13	....
'11*	4·61	4·03	4·85	4·60	-0·58	0·24	....
1900-04	3·18	3·33	5·39	3·55	0·15	2·21	....
1905-09	3·61	3·94	4·97	4·41	0·33	1·36	....

* Home interest for 1911 misleading as it is based on only three issues, two of which are industrial.

foreign investment nearly ceased during the war time, but of late years has gone ahead of colonial, as is to be expected, considering the much wider field included in foreign countries.

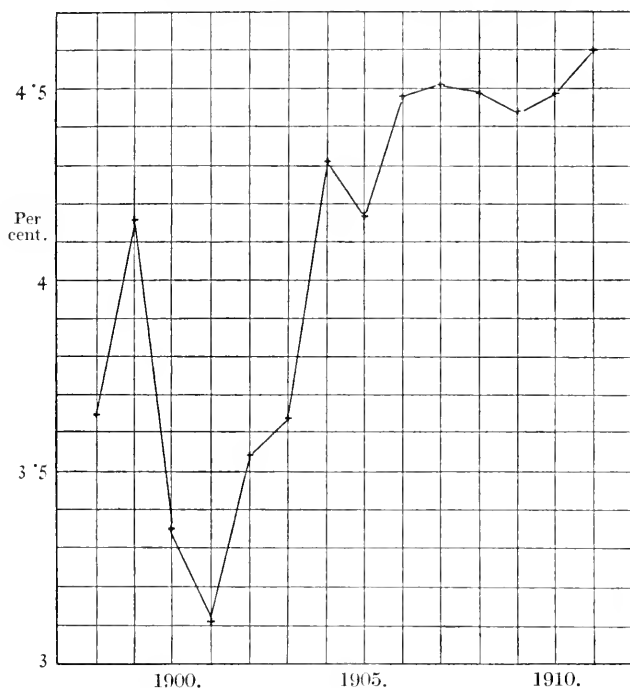
The influence of the war is, of course, very clearly marked. But the grand total of investments has not varied so much as might be expected: it shows fairly steady progress, and there is little indication that the Government expenditure of 200,000,000*l.* made the country poorer. That amount is, indeed, only about a year's savings, and some of it was only transferred from one pocket to another, not destroyed. It would be otherwise, no doubt, with a war that exhausted the nation seriously, and kept the population from doing useful work. The Boer War, though of importance to Government finance, was a trifle to the English nation, and has certainly not had the effect on the rate of interest sometimes attributed to it by political speakers.

With regard to Table B we may first direct attention to the rarity of defaults. The first year mentioned in the table, 1888, was a year of large investments in South America, and soon after there was a tremendous loss due to failures in that country. More than half of the capital invested in foreign countries in 1888 was affected; some of it has been permanently written off; some is now getting interest and acquiring improved value. The figures in the table, based on the yield for ten years after issue, indicate that about 40 per cent. of the money was lost. Since then, however, the table shows only three defaults, none very large, and one of them in England itself. The defaulting capital is less than one half per cent. of the total, and one may say that, taken broadly, large failures, in time of peace, at any rate, are things of the past. We shall revert to this point in considering the difference between home and foreign yields.

Next, the course of average interest obtained. This is shown by the small diagram (Fig. I) as well as by the table. It is well known that the course of interest was declining until the middle of the last decade of the nineteenth century, and has recovered considerably since. The only exact information usually available is as to the yield of consols, and rates of discount. The table gives a more general view of the matter, dealing with a great mass of reasonably secure investments. The year 1888 shows a high expected interest, probably due partly to the feeling of insecurity in the issues offered. The feeling was well justified, for the yield actually obtained was below the normal. 1893 shows the influence of previous disappointments, which caused a high rate to be demanded, especially on colonial loans. 1898 was about normal. The following years were rendered abnormal by the two wars. The Japanese war produced the usual effect, *i.e.*, it forced capital into unproductive channels by the offer of exceptionally high interest—the average on foreign loans going up to 5·83, and on all loans to 4·31. The Boer war, on the other hand, had the extraordinary effect of *lowering* the rate of interest, by persuading capitalists to lend money to the British Government for less than they would have got in the ordinary course of trade. Looked at dispassionately, this seems a preposterous aberration of

credit, for the promises of the British Government cannot really be worth more than those of the sound industrial community of Britain, which supports this government, and it may well be doubted whether the phenomenon would be repeated if there were a really great war, though consols still possess an unreasonably high credit (despite the popular opinion that they are going to the dogs).

FIG. I.—*Annual average rate on large investments.*

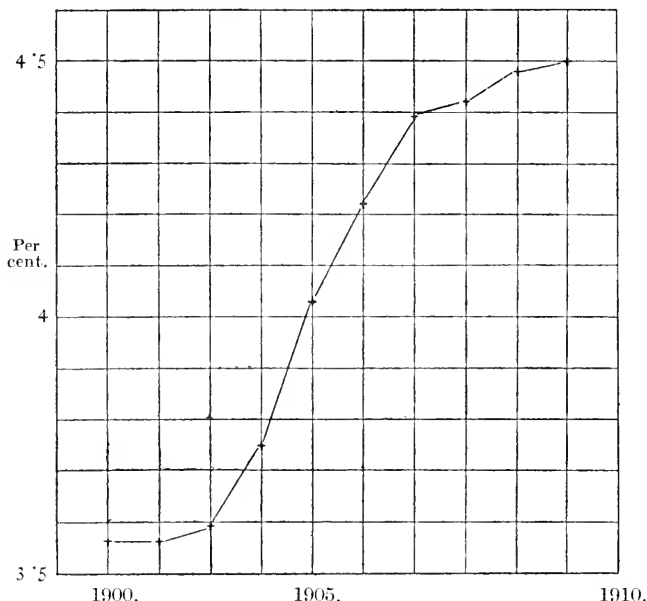


The years since the Russo-Japanese war have been undisturbed ; they show that money first rose markedly, and then remained nearly stationary. Taking the whole period from 1898 onwards, Colonial issues, being in steady large quantity, and free from abnormal influences, show the course of interest best. The increase has been about 1 per cent. in a little more than a decade ; but the rate may probably be considered stationary now. The following small figure (Fig. II) of quinquennial averages (not weighted) shows the course more plainly (average of five years set at middle year).

Next the columns of differences may be considered. Omitting 1888 and 1893, the average interest on Colonial issues is higher than that on home by 0.20 per cent. As, however, this includes two years of large war issues, the latter years give more clearly the difference, which appears to be from a quarter to a third of 1 per cent. Money invested (in large amounts) in the Colonies,

brings to the British capitalist very little more interest than what is invested at home.

FIG. II.—*Quinquennial average rate on large investments.*



The difference "foreign—home"¹ is much larger. Over the thirteen years, 1898-1910, it averages 1.7 per cent., but this includes the Japanese war, which forced up the foreign rate unduly. Since that time the difference has been round about $1\frac{1}{4}$ per cent. This may be taken as the difference in credit now, and there is no clear indication that it is falling in amount.

Bonds, such as we are considering, give no more trouble to the investor, and are just as saleable when issued by a foreign government or railway as by an English one. The difference must, therefore be attributed to insurance against risk. As an insurance premium it appears to be excessive, for, as pointed out above, there are now hardly more foreign defaults than home ones, indeed hardly any defaults at all. Probably foreign borrowers are still paying for the want of confidence inspired by the financial errors of a generation ago, for credit is notoriously a slow growth. Perhaps also the risks anticipated from war are supposed to be greater in foreign countries than in the British Empire.

According to strict economic theory there ought to be no difference in rate of interest on money lent in London to various borrowers other than that due to difference in convenience (in this case none)

¹ Home issues have fallen to such a small amount lately that it is difficult to draw statistical conclusions from them.

and in risk. The money should distribute itself between applicants in such a way that its marginal utility to all of them is the same. It is open to question whether this economic ideal is actually attained; if the difference of $1\frac{1}{4}$ per cent. is not adequately accounted for as an insurance premium, it follows that home investments are treated by capitalists with favour, on account of conservatism, prejudice, sentiment, any non-economic motive.

Now, of late years, some three pounds have been invested in foreign countries for one pound at home; but from what we have just seen, it appears that the opportunities for profitable use of money abroad are really greater even than this, so that non-economic causes keep a considerable amount at home, which might more advantageously (to the capitalist at least) be used abroad—another conclusion which contradicts popular opinion.

With regard to the future, the difference between the rates on foreign and home loans may be expected to diminish, although the statistics given above do not clearly show such a tendency. For both causes of the difference must weaken; the element of risk in foreign investments is diminishing, and unless some unexpected catastrophe restores it, should continue to do so, and the forces of conservatism and prejudice will weaken too, unless some acute revival of national sentiment makes foreign investment unpopular. Now if the difference is reduced, the foreign rate will come down, but also the home rate will go up, otherwise the productivity of the whole would be reduced, and if we lump together home and colonial, the mass being about equal to the mass of foreign investments, the change on the two sides should be approximately equal (except so far as real risk of default is lessening). If this argument is correct we may expect to see a gradual rise in the rate of interest on home loans (including British Government securities.) The rate of interest is not at present normal, on account of the rising level of prices;² if it returns to normal that would involve a fall, but whether this occurs or not, a rise, due to change in relative credit, should be superposed on the movement.

For comparison, the yield on consols is given below:—

Year.	Mean interest on large issues.	Yield of Consols.	Difference.	Year.	Mean interest on large issues.	Yield of Consols.	Difference.
	Per cent.	Per cent.	Per cent.		Per cent.	Per cent.	Per cent.
1893.....	4.14	2.60	1.54	1905.....	4.17	2.80	1.37
'98.....	3.65	2.32	1.33	'06.....	4.48	2.85	1.63
'99.....	4.16	2.35	1.81	'07.....	4.51	3.00	1.51
				'08.....	4.49	2.90	1.59
1900.....	3.35	2.55	0.80	'09.....	4.43	3.00	1.43
'01.....	3.11	2.65	0.46				
'02.....	3.54	2.65	0.89	1910.....	4.49	3.10	1.39
'03.....	3.64	2.75	0.89	'11.....	4.60	3.20	1.40
'04.....	4.31	2.85	1.46				

1888 is omitted on account of the conversion of consols and the Argentine failures.

² See Lehfeldt, "Public Loans," *Econ. Journ.*, March, 1912.

It will be seen that the difference is as large as it was in the nineties (when security of foreign loans was not so good as at present), and larger than in the early years of this century. It follows that consols have not improved in yield so much as investments generally; in other words, not fallen enough in price to correspond with the movement in the rate of interest—they are still overrated, and there is nothing to be either surprised or alarmed at in their recent fall in price.

Share Issues.

The conclusions to be drawn as to share issues are by no means so definite, as the number of instances is really too small for statistical treatment. The following table gives the rates of dividend (on the actual cash capital subscribed), taken for the ten years following the issue wherever possible, and otherwise, up to the end of 1910. Issues later than 1907 have not been dealt with, as their fortune is yet too uncertain. The average of each year is given, and the average of each group in five-yearly periods:—

Year.	Large share issues (Home, Colonial and Foreign).	Mean rate of interest.	Year.	Large share issues (Home, Colonial and Foreign).	Mean rate of interest.
	£	Per cent.		£	Per cent.
1888.....	4,900	4·95	1903.....	—	—
'93.....	1,095	4·08	'04.....	5,430	5·32
'98.....	10,541	3·74	'05.....	13,754	5·97
'99.....	12,189	2·32	'06.....	13,553	5·83
1900.....	11,666	3·76	'07.....	8,397	6·00
'01.....	8,650	4·65			
'02.....	2,310	2·53	1898-1907	86,490	4·60

Years.	Home issues		Colonial.		Foreign.	
	£	Per cent	£	Per cent	£	Per cent.
1898-1902.....	31,582	3·45	7,062	2·63	6,712	4·53
1903-1907.....	5,000	3·37	12,925	6·25	23,209	6·14

The rates of interest earned cannot be brought into any satisfactory relation with the current rate of interest on loans. There were several unfortunate investments in the earlier years, whilst in the period 1903-07 the investments were chiefly in Canadian and Argentine railways, which have been very successful. There is, in fact, more of luck than of general tendencies to be seen in the numbers. There is a noticeable difference between the yields on home and foreign share investments; this is because the former include large issues of home railway ordinary stocks, which have been regarded almost as if they were a gilt-edged bond issue. Apart from that it is impossible to say from these figures that investment abroad is much more attractive than at home, and several Colonial investments have been failures.

On the whole the yield obtained from shares in large companies

does not much exceed the interest paid on loan money. The difference appears to be roughly $\frac{1}{2}$ per cent. in favour of shares; this is all there is to compensate for the disadvantage of a speculative income, and even this might easily disappear in a less prosperous period than the present. The preference which the public shows for bond issues is thus fully justified.

It is proposed to consider the differences between large and small issues subsequently.

This work has begun at the London School of Economics, on the suggestion of Mr. Pember Reeves, the Director. To him, and to other officials of the School the author wishes to offer his sincere thanks for good advice and courteous help.

THE CONSUMPTION OF ALCOHOLIC LIQUORS IN THE UNITED KINGDOM.

By AUGUSTUS D. WEBB, B.Sc. (ECON.).

IN Mr. George B. Wilson's Howard Medal Essay on the variations during the last twenty years in the consumption of intoxicating drinks in the United Kingdom, &c., published in the January issue of the last volume of the *Journal*, it is stated (page 190) that the statistics show "that the general trend of consumption has been downward. An individual wave may rise high, but the tide apparently is ebbing. The lowest point in 1909 is many degrees lower than the lowest point in 1884-86, or 1894, and the highest point in 1899 or 1900 is not nearly so high as the highest points in 1874-76." The conclusion here expressed is repeated in Mr. Wilson's last annual letter to *The Times* on the "National Drink Bill" (*The Times* of April 15, 1912), where he further states: "It is encouraging to note that during the last forty years the trend of consumption of alcoholic liquors in the United Kingdom has been downward." This is approximately true of consumption *per head*, which is what Mr. Wilson probably had in mind, although, as regards beer, the generalisation is rather too strongly expressed. But is the "downward trend" also characteristic of total consumption? In recent years, during which the total consumption of alcoholic drinks has been falling, this question would generally have been answered in the affirmative. It is noteworthy, however, that the Chancellor of the Exchequer in his last Budget speech (April 2, 1912: *see* House of Commons Debates, volume 35; columns 1053 *et seq.*) estimated for a normal *increase* in consumption in the current financial year, instead of a normal decrease. His remarks on this point were as follows:—

"There has been a curious change in the last year (*i.e.* the financial year 1911-12) in the matter of the consumption of alcoholic liquors. I remember the right honourable gentleman (Mr. Austen Chamberlain) . . . pointing out that for the first time in a period of prosperity the consumption of intoxicating liquors had gone down, and he rejoiced, with the rest of the Committee, in the

prospect that it was a permanent change in the habits of the people. It seemed for some years as if that prediction would be verified. . . . the consumption of alcoholic liquors steadily went down, and my advisers came to the conclusion that we must in future reckon upon a steady diminution in the quantity consumed. . . . But last year there was a change." The Chancellor then pointed out that there had been an increase in the consumption of beer and spirits, which he associated partly with the exceptionally hot summer and partly with the improved spending power of the working classes. He then estimated, after allowing for the exceptional circumstances of 1911-12, for a continuance of the upward movement in the present financial year, 1912-13.

This striking change in the official view of the probable course of consumption of alcoholic liquors makes it worth while to re-examine the statistics and the conclusions hitherto drawn from them. To obtain satisfactory results it is necessary to go back much farther than the starting-point (1890) laid down for Mr. Wilson's essay. I have accordingly traced the course of consumption of spirits, beer, and wine from about 1860. It would be of very doubtful utility to go back any farther. The spirit duties were not made uniform throughout the United Kingdom until 1858, and during the immediately preceding years changes of duty were fairly frequent. In 1860 a heavy increase in the duty was made (1s. 11d. per gallon, or about 24 per cent.). Then no change occurred until 1890, when 6d. was added. A further 6d. was added in 1894, but lapsed in 1895. This was re-imposed in 1900, and in 1909 the heavy addition of 3s. 9d. per gallon was made. These alterations of duty produced temporary disturbances in the clearances of spirits at the time they were made, but they do not appear to have permanently modified the trend of consumption. Even the increase of the duty in 1909 by about 33 per cent., although it lowered the general level of consumption, does not yet appear to have affected the trend.

The year 1860 marks an extensive downward revision of the wine duties, as a result of which consumption increased very considerably. Compared with this change, later alterations of the duties were insignificant and appear to have produced no permanent effect on the general trend of consumption.

Exact statistics of the consumption of beer are not available for the first twenty years of our period. During that time there was no direct tax on beer as such, but on malt, and the figures used for these years are deduced from the diagrams of alcoholic beverages, &c., published as a House of Commons Return (No. 329) in 1894. The figures for individual years are therefore approximations, but their general trend can be accepted as accurate. The malt tax was converted into a duty on beer in 1880, and the figures for 1881 onwards are accordingly based on exact records. (See Appendix II for table showing dates on which changes of duties took effect.)

The quantities of potable spirits (British and imported together), beer, and wine retained for consumption in the United Kingdom in

each year since 1860 are given in Appendix I. An examination of these figures shows clearly that, during the last fifty years, there have been two periods of rising consumption and two periods of falling consumption. They are as follows :—

Spirits (total of British and imported).—The first period extends from 1862 or 1863 to 1875, during which the trend was upwards, with a temporary decline in 1867 and 1868. The next period lasted until 1887, during which the trend was downwards, with temporary increases in 1881 and 1883. This was followed by the second upward movement, lasting until 1900, with a temporary depression in 1893 and 1894. Then succeeded the second downward movement lasting until about 1910, with a temporary check in 1907.

Beer.—The first upward movement was from 1860 to 1876, with temporary checks in 1866, 1867 and 1871. Then the course of consumption was irregular until about 1885, but the trend was downwards. This was succeeded by the second upward trend, lasting until 1899, with a temporary break in 1892. Then followed the second downward movement lasting until 1909, with a break about 1906.

Wine.—The large increase shown in 1861 was due mainly to the revision of the duties. We may start with, say, 1863. From that year, the course of consumption was upwards until 1876 with temporary decreases in 1869 and 1874, then downwards until 1886, with a temporary increase about 1880, then again upwards until 1899, with temporary decreases in 1888 and 1891-94, and then again downwards until about 1908, with temporary increases in 1902 and 1906-07.

These characteristics are summarised in the following table :—

Period.	Average annual increase (+) or decrease (−) in total consumption.		
	Spirits.	Beer.	Wine.
	Per cent.	Per cent.	Per cent.
First: until 1875-76.....	+ 4·4	+ 3·1	+ 7·3*
Second: until 1885-87.....	− 1·7	− 1·4	− 3·2
Third: until 1899-1900	+ 2·4	+ 2·2	+ 1·8
Fourth: until 1908-10..... {	− 2·3 (to 1908) {	− 1·3 {	− 4·0 (to 1908) {
	− 4·2 („ '10) }	(to 1909) }	− 3·5 („ '09) }

* Average from 1860 to 1876. From 1863 to 1876 the average is + 4·7 per cent.

The same broad features are disclosed if the annual fluctuations are eliminated by averaging. The results are given in the next table. Nine-year continuous averages have been taken (*i.e.*, the average of 1860-68, 1861-69, 1862-70, and so on). Nine years have been selected as the period to average as being sufficiently long to eliminate all temporary and casual disturbances, and also, as a matter of convenience, permitting the average being placed opposite the fifth year of the period, whereas, say, a ten-year period would have brought the average between the fifth and sixth years.

Period.	Trend of consumption.	Average annual rate of change in the average annual consumption (nine-year continuous averages).		
		Spirits.	Beer.	Wine.
		Per cent.	Per cent.	Per cent.
First	Upwards	+ 2·9	+ 2·4	+ 4·1
Second	Downwards	- 1·3	- 1·2	- 1·5
Third.....	Upwards	+ 1·3	+ 1·5	+ 0·9
Fourth	Downwards	- 2·2	- 0·8	- 3·0

The course of consumption is clearly represented in Diagrams 1 and 2. The first of these shows the annual fluctuations, and the second gives the curves of nine-year averages, *i.e.* the curves on the first diagram smoothed.

The quantities so far dealt with are the total quantities retained for consumption. The course of consumption *per head*, however, shows an exactly similar rise and fall between 1860 and 1885-87, repeated within the next twenty-five years. This is illustrated in Diagrams 3 and 4. It will be observed, however, that whereas the crest of the second wave of *total* consumption of beer and spirits was higher than that of the first wave (Diagram 2), the second wave of *per head* consumption did not reach such a high point as the first (Diagram 4). Thus, the general trend or "symptom" of *total* consumption over the whole fifty years has been upwards, but the general trend of consumption *per head* has been, as stated by Mr. Wilson, downwards, although the consumption per head of beer may almost be said to reveal no symptomatic movement. It may be noted that the heavy fall in the consumption of spirits in 1909, which pulled down the nine-year averages, was quite abnormal, being caused by the great increase in the duties.

It is interesting to note that the explanation of the ebb in the course of consumption during the late 'seventies and early 'eighties of last century was sought for in the growth of temperance, in the same way as the recent ebb is usually explained. Thus the Commissioners of Inland Revenue stated in their 28th Annual Report (1884-85, page 13) with reference to the consumption of spirits: "The enormous decrease that has occurred since 1875-76, in spite of the increase in the population during the last nine years, is most striking, and can hardly fail to be considered a convincing proof of the growth of temperance." The Commissioners of Customs stated in their 31st Annual Report (1886-87, page 13), also with reference to the consumption of spirits (British and imported): "However unsatisfactory the decline in the yield of the spirit duties may be to those to whom is entrusted the duty of collecting the revenue, there can be little doubt that, as has been frequently pointed out, it is indicative of improved habits of temperance in the use of alcoholic drinks amongst the general body of the population, and of a consequent advance in their material well-being." (The years 1884-86 marked a period of great depression!) Again, in a memorandum prepared by Sir Algernon West, K.C.B. (then Chairman of the Inland Revenue), for the Royal Commission appointed in 1885 to inquire into the depression of trade and industry then

DIAGRAM 1.

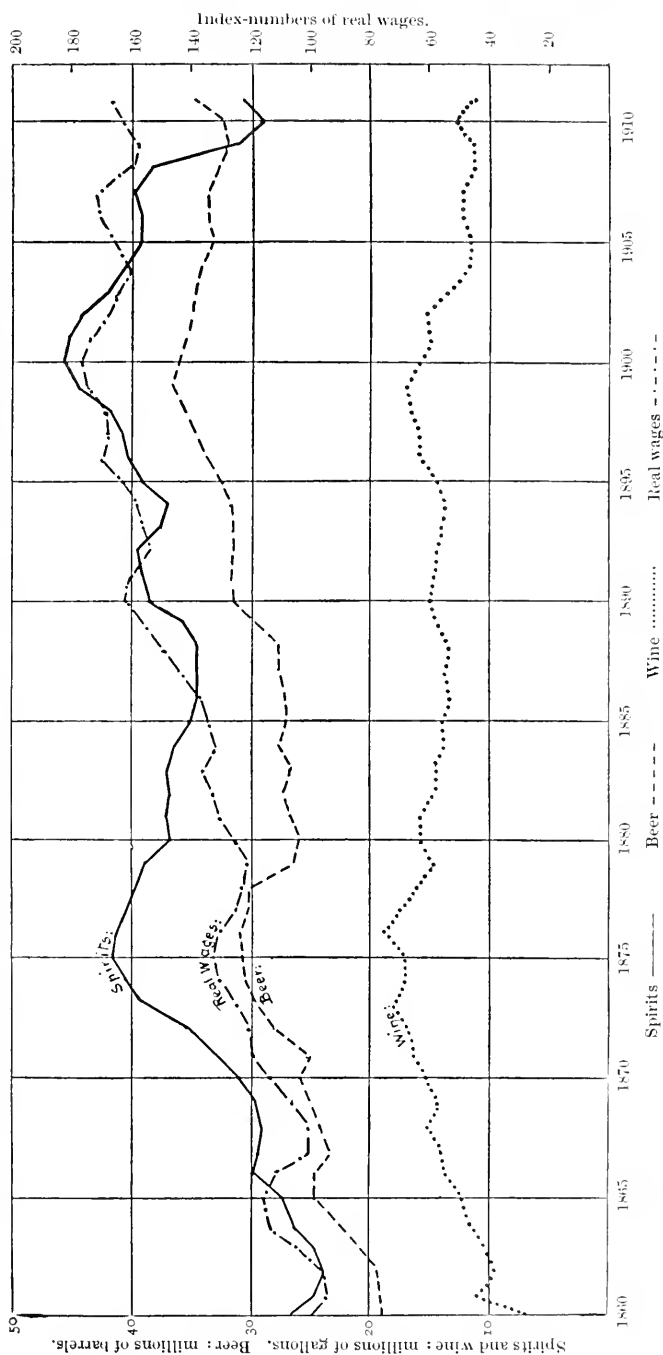
Curves of total consumption of spirits, beer and wine ; and curve of real wages (allowing for unemployment).

DIAGRAM 2.—*Curves of moving averages (nine-year averages) of total consumption of beer, spirits and wine; and of real wages.*

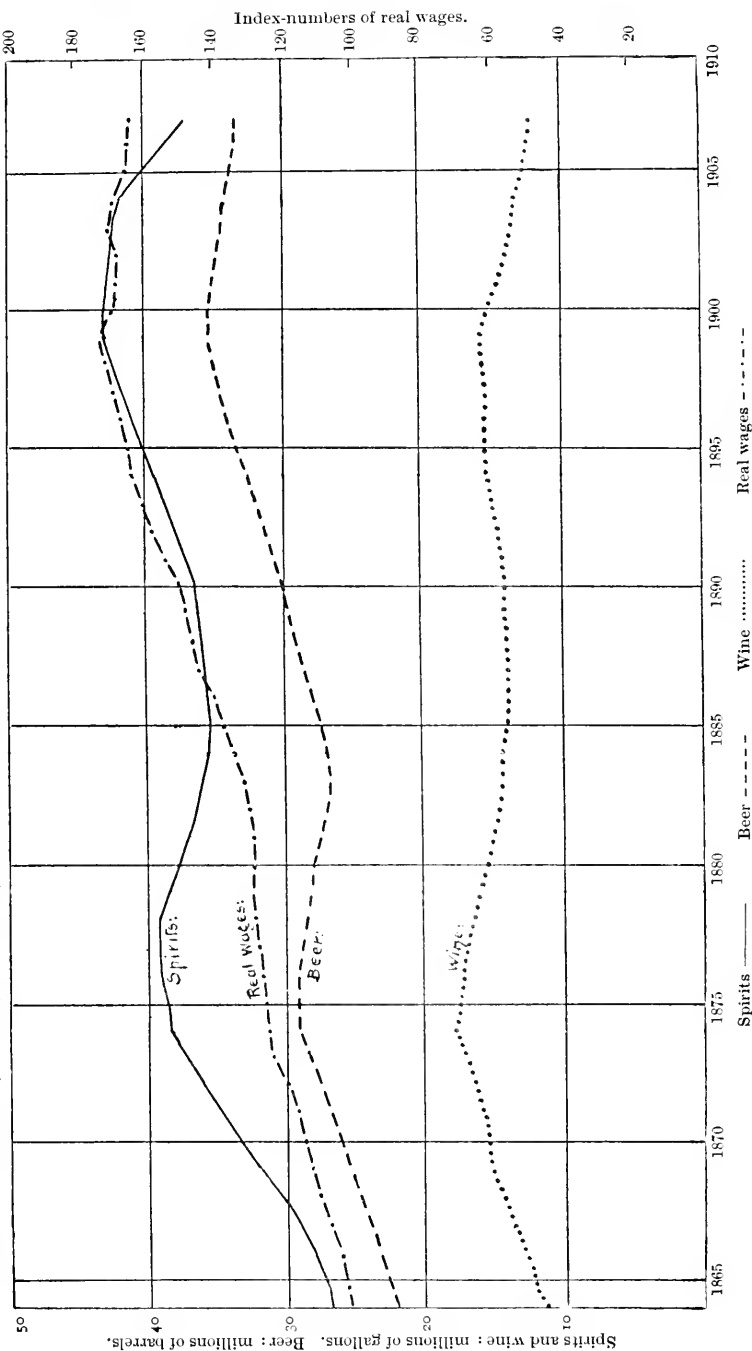


DIAGRAM 3.—*Consumption of beer, spirits and wine per head; and curve of real wages.*

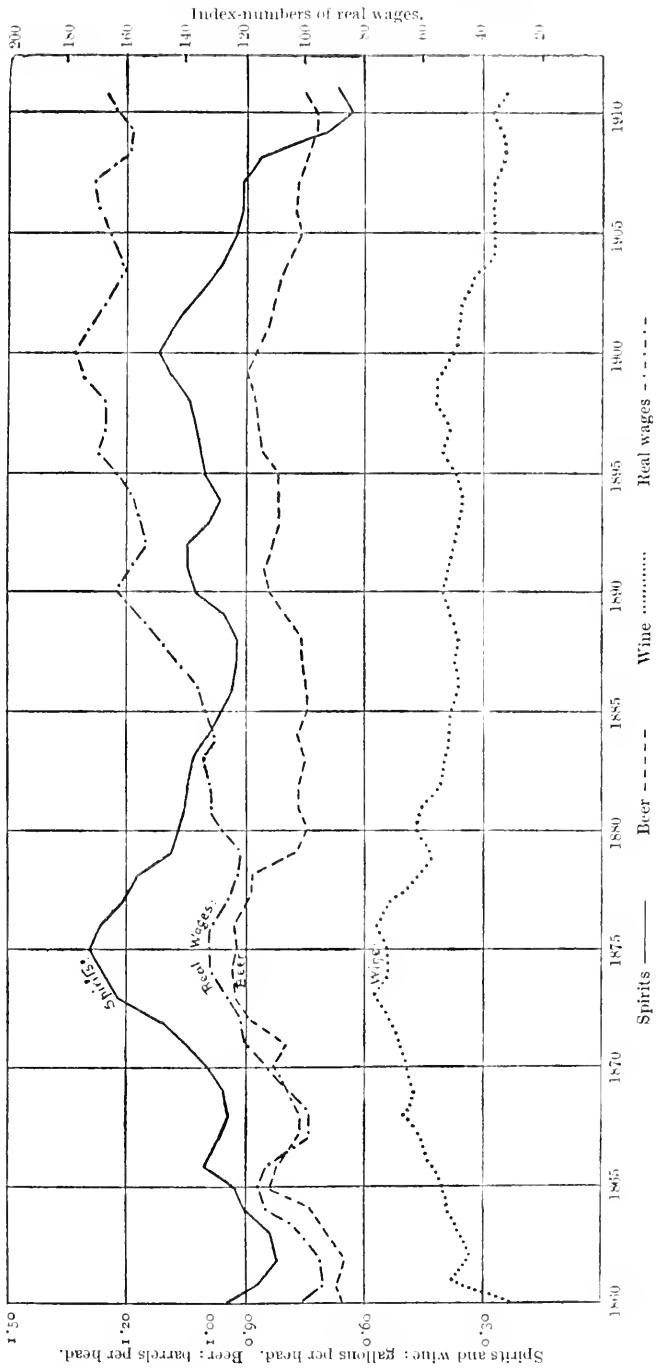
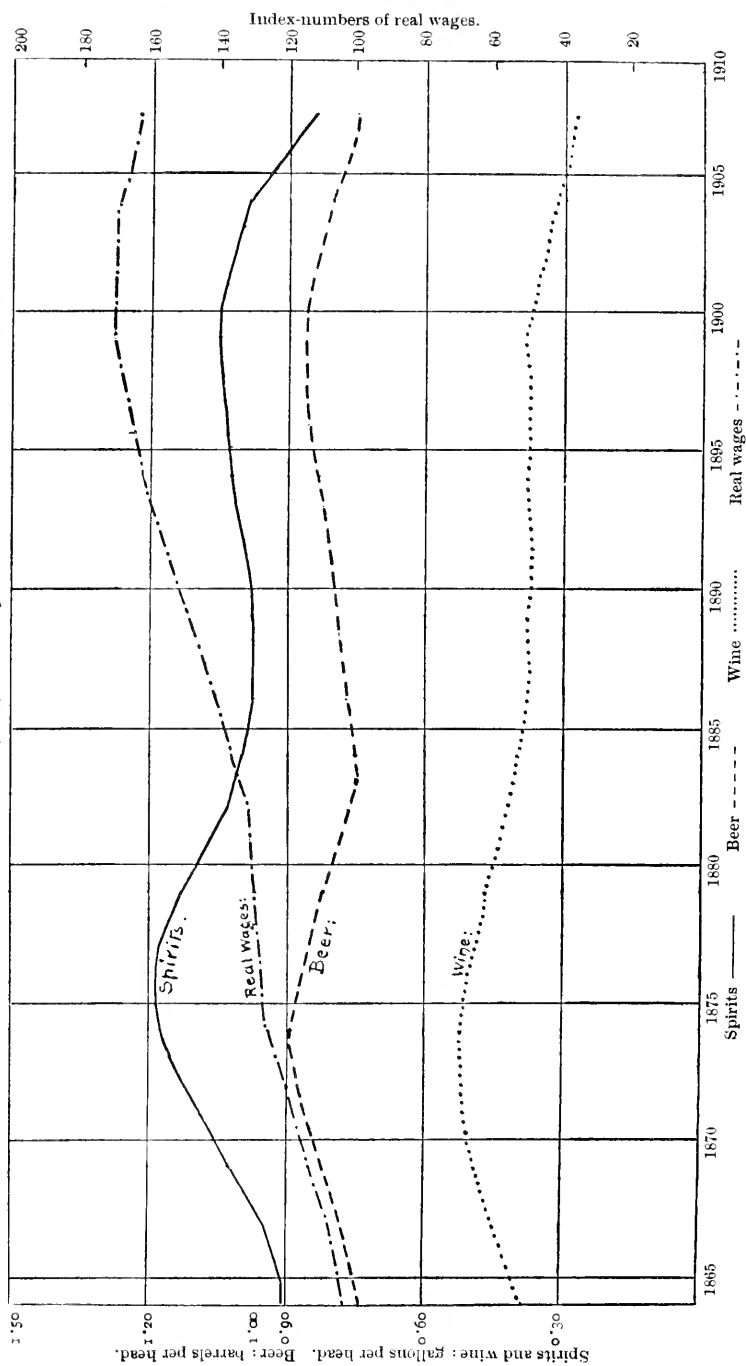


DIAGRAM 4.—Curves of moving averages (nine-year averages) of consumption per head of beer, spirits and wine; and curve of averages of real wages.



prevailing, it was stated: "As the revenue derived from the consumption of alcoholic drinks forms such an important item in the fiscal arrangements of this country, inquiries are made from time to time to discover the causes of its rise or fall; the result of which inquiries leads me to think that, although there are other disturbing influences which affect it at certain periods, but which are more or less transitory, the gradual decline in the consumption of alcoholic beverages must mainly be attributed to the growth of temperance habits amongst the people. This assertion must be taken for what it is worth, as in the absence of statistics it is impossible to estimate the number of persons who have joined the various temperance leagues in this country in the past few years, but it is beyond all doubt that the movement continues to make progress, and to exercise a large amount of influence upon the drinking habits of the community." (Final Report of the Commission; Appendix C (C. 4893, 1886).) In his evidence before the Commission on October 16, 1885, Sir A. West said: "I think it was four or five years ago, in my statement to the Chancellor of the Exchequer at the beginning of the year, I said that I should always look upon the revenue from spirits as a decreasing source of revenue." (Question 919.)

All these statements were made on the very eve of the upward trend of consumption (and revenue) which lasted for about thirteen years. Nevertheless, the fact that the second cycle of *per head* consumption was at a lower level than the first cycle may, perhaps, be regarded as evidence of a continuous downward "temperance pull," although this pull is periodically overpowered by other influences causing increased consumption.

The causes of the rhythmic rise and fall in the trend of consumption during the last fifty years are well worth investigation. On *a priori* grounds, it might be expected that the consumption of beer and spirits, if not of wine, would rise and fall with the variations in the spending power of the working classes, as measured by "real wages." Even wine consumption might be supposed to respond to these variations if they may be regarded as an index to the variations in the prosperity of the middle and upper classes. I find that, in fact, the fluctuations in "real wages" and in the consumption of alcoholic drinks are intimately connected together. (The connection between wages, employment, &c., and alcoholic consumption was briefly indicated by Mr. Wilson.) For my data of wages since 1860 I have taken the index-numbers of "real wages" calculated by Mr. G. H. Wood and contributed to the *Journal* in March, 1909 ("Real Wages and the Standard of Comfort since 1850," by George H. Wood.) These index-numbers are based on the course of money wages since 1850 as investigated mainly by Mr. Bowley and Mr. Wood, and in calculating the real wages Mr. Wood has allowed for changes in retail prices and rents (also calculated by him) and in the amount of employment (as given by the Board of Trade percentages of unemployment). Mr. Wood's figures end with 1902, and have been roughly continued by the present writer by means of the Board of Trade statistics of unemployment, wages, and retail prices.

All the data which go to make up these index-numbers of real wages are drawn from more or less limited fields of investigation, and it is therefore doubtful how far the index-numbers may be regarded as an accurate representation of the true course of real wages in the period they cover. But different investigations have tended to confirm the general movement of money wages established by Mr. Bowley and Mr. Wood, and different series of index-numbers of prices also tend to confirm one another in their general features. In the present state of our knowledge, therefore, it may not unreasonably be assumed that, although Mr. Wood's index-numbers of real wages may be too high or too low for any particular year, nevertheless they may suffice to show whether real wages in general moved upwards or downwards from year to year, and, with a reasonable margin for error, within what limits they moved.

These index-numbers are given in Appendix III, and they are also represented in the diagrams—in Diagrams 1 and 3, the annual fluctuations being shown, and in Diagrams 2 and 4, the nine-year continuous averages.

That the fluctuations of real wages and the consumption of alcoholic drinks are correlated is obvious from the diagrams. I have worked out the degrees of correlation, taking the fluctuations from the nine-year moving average in each case, and the results are given below. I find, what is perhaps to be expected *à priori*, that the correlation between the fluctuations of real wages and those of beer, spirits and wine taken one year later (*i.e.*, correlating real wages in, say, 1870 with spirits, beer and wine in 1871, and so on) is appreciably greater than the correlation between the fluctuations in the same years. This would mean that the effect of a rise or fall in real wages on the consumption of alcoholic liquors is not felt in its full force until after the lapse of some months.

Table of correlation results.

	Correlation between the deviations from nine-year averages, taking the deviations of beer, spirits and wine.	
	In the same year as those of real wages.	One year later than those of real wages.
Correlation between the deviations in <i>real wages</i> and in the total consumption of:—		
Spirits	+ '52 ± '07	+ '82 ± '03
Beer	+ '55 ± '07	+ '72 ± '05
Wine	+ '61 ± '07	+ '77 ± '04

All these results are highly significant.

It will be observed from the diagrams that not only are the annual fluctuations of real wages correlated with those of alcoholic drinks (Diagrams 1 and 3), but the long period fluctuations of the two sets of phenomena are not altogether dissimilar (Diagrams 2 and 4). During the first period of increasing consumption, the trend of real wages was upwards, rising fairly rapidly at the average annual rate of 1·8 per cent. During the next period, while consumption was downwards, the upward trend of real wages slackened off

to only 0.5 per cent. per year, *i.e.*, it was almost stationary. During the third period, when consumption again took an upward flight, the upward trend of real wages was also fairly rapid, averaging 1.7 per cent. per year. Finally, during the recent period of declining consumption, the trend of real wages was actually downwards, averaging 0.2 per cent. per year. If, instead of the curve of nine-year averages, we take the actual index-numbers of real wages with their annual fluctuations, we find that down to about 1874-75 there was an annual average increase of 2 per cent.; during the next decade the annual increase averaged only 0.1 per cent., then followed a rapid increase down to about 1899, averaging again 2.0 per cent. per year, while the succeeding decade showed an average annual decline of 1.0 per cent. These results should be compared with the description of the course of consumption of spirits, beer and wine given above on page 209.

Does this examination of the course of consumption of alcoholic liquors during the last half century, and of its relation to the movements of real wages, afford any indication of consumption in the future? Social and economic conditions are changing so rapidly that it would be foolish to prophesy far ahead as to the probable mode of living of the working classes. But we may perhaps look two or three years ahead, and we can say in reply to the above question that the trend of consumption of beer, spirits, and wine shows signs of turning upwards again and starting on another cycle similar to those of the last half century. Whether the cycle will complete itself only the future, of course, can reveal. The consumption of both beer and spirits increased considerably in 1911, even after a liberal allowance is made in the case of beer for the abnormally hot and dry summer. It may be argued that the increase in the consumption of spirits was due to a reaction from the very heavy reduction caused by the increase of the spirit duties in 1909. But this would not explain the increase under beer. As regards wine, the quantities cleared in 1910 for consumption were abnormally high, and were stimulated by rising prices consequent on the failure of the 1910 vintage, and also by the importation of the "1908 port," which was ready for bottling in the autumn of 1910. It is practically certain that a large proportion of these clearances went into stock and not into actual consumption in that year, and that part of the consumption in 1911 was met from these accumulated stocks. In that case, it is highly probable that even the consumption of wine actually increased in 1911.

Further, the trend of real wages, after a decade of stagnation or decline, appears to be turning upwards again. From the intimate connection shown above to exist between the fluctuations and course of real wages and those of alcoholic consumption, the upward trend of the former lends strong support to the view that the latter is also trending upwards.

On the facts and tendencies before us, therefore, we may conclude that the Chancellor was justified in breaking the tradition of estimating for a normal decline in consumption and in suggesting that the tide was turning. It will be extremely interesting to see if the event confirms the forecast.

APPENDIX I.

Quantities of alcoholic liquors retained for consumption in the United Kingdom.

Calendar year.	Total consumption.			Consumption per head.		
	Spirits (potable).	Beer.	Wine.	Spirits (potable).	Beer.	Wine.
	Mln. proof galls.	Mln. stand. brls.	Mln. galls.	Pf. galls.	Stand. brls.	Galls.
1860	26·86	19·30*	6·72	·93	·67	·23
'61	24·71	19·50	10·69	·86	·68	·37
'62	24·02	19·60	9·76	·83	·67	·33
'63	24·68	20·70	10·42	·84	·71	·35
'64	26·49	22·40	11·40	·89	·74	·39
'65	27·34	24·80	11·99	·92	·83	·40
'66	30·00	24·60	13·24	1·00	·82	·44
'67	29·52	23·70	13·67	·98	·78	·45
'68	29·39	24·50	15·06	·95	·78	·50
'69	29·78	25·40	14·73	·96	·81	·48
1870	31·03	26·20	15·08	·99	·84	·49
'71	33·07	25·30	16·14	1·04	·81	·51
'72	35·92	28·50	16·77	1·12	·89	·53
'73	39·15	29·90	17·91	1·22	·93	·56
'74	40·53	30·40	17·17	1·25	·94	·53
'75	41·91	30·50	17·24	1·28	·93	·53
'76	41·46	31·00	18·54	1·25	·94	·56
'77	40·53	30·30	17·57	1·21	·90	·53
'78	39·81	30·30	16·17	1·17	·89	·48
'79	37·49	26·50	14·80	1·09	·78	·43
1880	36·96	26·00*	15·75	1·07	·75	·46
'81	37·05	26·97	15·55	1·06	·77	·45
'82	36·87	27·02	14·34	1·05	·77	·41
'83	36·98	26·83	14·29	1·04	·76	·40
'84	36·12	27·59	13·99	1·01	·77	·39
'85	34·52	27·10	13·77	·96	·75	·38
'86	34·12	27·13	13·17	·94	·75	·36
'87	34·10	27·73	13·59	·93	·76	·37
'88	34·14	27·87	13·42	·93	·76	·36
'89	35·79	29·82	14·07	·96	·80	·38
1890	38·37	31·24	14·92	1·02	·83	·40
'91	39·14	31·67	14·77	1·04	·84	·39
'92	39·47	31·51	14·54	1·04	·83	·38
'93	37·69	31·59	14·09	·98	·82	·37
'94	37·51	31·75	13·78	·97	·82	·36
'95	39·04	32·23	14·55	1·00	·82	·37
'96	40·08	33·86	15·776	1·01	·86	·40
'97	40·96	34·76	15·780	1·02	·87	·39
'98	41·71	35·62	16·54	1·03	·88	·41
'99	44·42	36·84	16·59	1·09	·90	·41
1900	45·89	36·08	15·82	1·12	·88	·38
'01	45·21	35·51	15·20	1·09	·85	·37
'02	44·08	35·24	15·28	1·05	·84	·36
'03	41·89	34·95	13·87	·99	·83	·33
'04	40·73	34·22	11·93	·96	·80	·28
'05	39·33	33·25	11·89	·92	·77	·28
'06	39·26	33·92	12·278	·91	·78	·28
'07	39·98	33·79	12·282	·91	·77	·28
'08	38·08	32·94	11·29	·86	·75	·26
'09	31·06	32·29	11·40	·70	·73	·26
1910	29·27	32·83	12·67	·65	·73	·28
'11	30·69	34·25	11·22	·68	·76	·25

* Beer figures from 1860 to 1880 are approximations.

The figures in the above table are obtained from the following sources :—

Spirits.—British spirits down to 1875 have been taken from the Trade and Navigation Accounts, and after that date from the Statistical Abstracts of the United Kingdom. Imported spirits have been taken from the Statistical Abstracts, except that figures before 1875 have been amended by the deduction of perfumed spirits, methylated spirits, &c.

Beer.—The figure for 1860 is estimated. From 1861 to 1880 inclusive the figures are estimated from the diagrams of alcoholic beverages, &c., published in House of Commons Return, No. 329 of 1894. From 1881 the figures are from the Statistical Abstracts.

Wine.—The figures are from the Statistical Abstracts.

In making the calculations given in the text the figures have been taken in millions and the nearest first decimal place.

APPENDIX II.

Changes in duties on spirits, beer and wine since 1860.

Year of change.	Rates of duty on		
	British spirits.*	Wine in cask.†	Beer.
	Per proof gallon.	Per gallon.	Per standard barrel.
1860 (February 28)	—	Reduced to 3s.	(Malt Tax in force down to 1880. See note ‡).
'60 (July 17) ...	Raised from 8s. 1d. to 10s.	—	
'61 (January 1)	—	Graduated from 1s. to 2s. 11d.	
'62 (April 4) ...	—	Under 26°, 1s.	
'80 (October 1)	—	„ 42°, 2s. 6d.	6s. 3d. per standard barrel of 1,057°.‡
'86 (August 15)	—	Under 30°, 1s.	—
'89 (April 16) ...	—	„ 42°, 2s. 6d.	6s. 3d. per standard barrel of 1,055°.
'90 („ 18) ...	10s. 6d.	—	—
'94 („ 17) ...	11s.	—	6s. 9d.
'95 (July 1)	10s. 6d.	—	—
'99 (April 14) ...	—	Under 30°, 1s. 3d....	—
1900 (March 6) ...	11s.	„ 42°, 3s.	7s. 9d.
'09 (April 30) ...	14s. 9d.	—	—

* The rates on foreign spirits changed correspondingly.

† From 1888 there were additional rates on wine in bottle.

‡ The old Malt Tax which this superseded was equivalent to about 5s. 6d. per barrel of beer.

APPENDIX III.

Index-numbers of real wages (based on money wages, retail prices, rents and unemployment).

[G. H. Wood: "Real Wages and the Standard of Comfort since 1850." *Journal of the Royal Statistical Society*, vol. lxxii, March, 1909. The figures after 1902 have been roughly calculated by the present writer.]

Year.	Real wages.		Year.	Real wages.	
	Full work (1850=100).	Allowing for unemploy- ment.		Full work (1850=100).	Allowing for unemploy- ment.
1860	103	101	1886	151	136
'61	100	95	'87	155	143
'62	105	96	'88	157	149
'63	109	103	'89	159	155
'64	117	113			
'65	117	115	1890	166	162
'66	116	112	'91	164	159
'67	109	101	'92	163	153
'68	110	101	'93	167	155
'69	115	107	'94	170	158
			'95	174	163
1870	118	113	'96	176	170
'71	121	120	'97	176	169
'72	122	121	'98	174	169
'73	128	127	'99	180	176
'74	133	131			
'75	135	132	1900	183	177
'76	137	131	'01	181	174
'77	133	127	'02	177	169
'78	132	123	'03	174	166
'79	137	121	'04	172	161
			'05	174	166
1880	134	127	'06	177	170
'81	136	131	'07	178	171
'82	135	132	'08	174	160
'83	139	136	'09	173	159
'84	144	132			
'85	148	134	1910	171	163
			'11	172	166

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*Medical benefit: a study of the experience of Germany and Denmark.* By I. G. Gibbon, B.A., D.Sc. xv + 296 pp., 8vo. London: P. S. King and Son, 1912. Price 6s. net.

In the *Journal* for May, 1911 (lxxiv, 647), we had the pleasure warmly to commend Mr. Gibbon's previous work on Unemployed Insurance. We are glad to observe that it has won for him the degree of Doctor of Science in the University of London, and that he has been encouraged to prosecute his researches further. The present work contains much valuable statistical and general information on a difficult question.

In Germany, the number of persons insured against sickness in 1909 was 21 per cent., against invalidity and old age 24 per cent., of the total population, that proportion having steadily increased from the coming into force of the first imperial compulsory insurance law in 1884. Of these, 52 per cent. were in district societies, that is local bodies composed of workmen in the same trades; 26 per cent. in societies set up by the larger employers; and the remaining 22 per cent. in communal insurance funds and various classes of voluntary societies. In Denmark, the number of persons insured against sickness at the end of 1909 was about 23 per cent. of the total population, having increased more than fivefold since 1893. Dr. Gibbon notes the fact that a larger proportion of the population has been directly insured against sickness in Denmark, with her voluntary system, than in Germany, under her compulsory scheme, but he states some points which qualify this comparison. In Denmark, insurance is effected through self-governing societies, averaging 400 members each. Some interesting particulars of the societies grouped in Copenhagen are given, showing that among 195 general practitioners undertaking society work, 53 had over 1,000 members allotted to each of them and 90 had less than 500, indicating a tendency to select a comparatively small number to do the bulk of the work.

For the remuneration of practitioners in Germany, each society is left to make its own arrangements. The general average of the societies (exclusive of miners' societies) was 5*s.* 10*d.* per member per annum, exclusive of institutional service, ranging from 8*s.* 8*d.* in Kiel to 5*s.* 3*d.* in Cologne. Dr. Gibbon gives details of the expenditure in the various classes of societies, showing a very large increase. The average number of days per member for which benefit has been given has increased, and also the cost of it.

In Denmark, the terms of medical service are arranged between the federations of sickness societies and the local associations of doctors. The average was 4*s.* 7*d.* per member, ranging from 4*s.* 3*d.* in Copenhagen to 5*s.* 1*d.* in the provincial towns. There has been a large increase in the cost. The average number of days' benefit per member has, notwithstanding, diminished. The State subsidy originally exceeded the payments for medical service, but since 1900 the cost of medical service has more and more each year exceeded the subsidy.

Medical and surgical requirements are in general provided for separately from the remuneration of the practitioners. In Germany, the cost has risen from 1*s.* 10*d.* per member in 1888 to 3*s.* 8*d.* in 1910, in other words, it has doubled in 22 years. In Denmark, the cost to those societies which provide all such ordinary requirements for their members has risen from 2*s.* 1*d.* in 1893 to 2*s.* 11*d.* in 1909, or 40 per cent. in 16 years. It appears, however, that only 18 per cent. of the societies pay the full cost of medicines, dressings and the like, and that 57 per cent. pay no part of that cost.

The cost of institutional benefit is also separately provided for. This has risen in Germany from 1*s.* 8*d.* per member in 1893 to 3*s.* 6*d.* in 1910, or more than double; and in Denmark from 6*d.* per member in 1893 to 1*s.* 3*d.* per member in 1909, or 150 per cent.

Other valuable statistics are given in a series of eleven appendices, which also contain details as to the conflicts between sickness insurance societies and medical practitioners, and the agreements that have been ultimately arrived at.

Dr. Gibbon states a number of practical conclusions which are worthy of attentive consideration. He holds that medical benefit should be provided by insurance societies in kind and without the interposition of an intermediate body; that agreements as to medical service are best made between the societies or a federation of societies and the doctors as an organised corporate body; that insured persons should be allowed to choose the doctor by whom they will be treated; that payment for medical service should be made in the form of capitation payments by the societies to the organised association of doctors, to be distributed by that association among the several doctors according to services rendered; that control of medical service should be exercised chiefly through the organisation of the doctors; that institutional treatment should be kept within narrow limits; that each insured person should pay out of his own pocket for a small part of the cost; and that systematic measures should be adopted for educating the insured public in matters touching health and medical treatment.

E.B.

2.—*Statistique des familles en 1906.* 205 pp., 4to. Paris: Statistique générale de la France, 1912.

This volume contains the results of two distinct inquiries, the Census of 1906, and a special, more detailed, inquiry respecting the families of employees of the State and of local authorities.

The first census of France at which an inquiry was made as to the number of children was that of 1886, and it related solely to surviving legitimate children. In 1891 and 1896 the question was repeated, and the duration of marriage demanded in addition. But the questions on these heads were placed on the "*bulletin individuel*," and no reduction of the data was possible according to the combined ages of husband and wife. In 1901, accordingly, the questions were transferred to the "*feuille de ménage*," and tables were given showing coefficients of natality for combined ages of the parents, and classifying married couples according to ages, duration of marriage, and number of children. At all censuses up to this date the inquiry related solely to surviving children, but at the last census of 1906 it was decided to inquire as to the number of children deceased as well, and the questions were: In what year were you married? (Give, if necessary, the years of successive marriages.) How many children have you? Still living? Dead? But the "*feuille de ménage*" not being so well filled up, as a rule, as the "*bulletin individuel*," these questions were again transferred to the latter. It was not thought necessary to carry out, at every census, an investigation into fertility in relation to ages of husband and wife in combination.

But the census schedule could not enter into detail as regards the children: no questions were asked, for example, as regards their ages. Hence it was decided to supplement the census by the special inquiry, already mentioned, as to the servants of the State, the Departments or the Communes. The principal questions were:—Grade, &c., in 1905? Year of birth? Salary? Other earnings? Unmarried, married, widowed or divorced? Year of marriage? Total number of children? For each surviving child—sex?—year of birth? For each deceased child—sex?—year of birth?—year of death? This inquiry resulted in some 260,000 available schedules from male employees and 24,000 from women, forming the basis of the second part of the present volume.

The census data are classified according to the civil condition of the head of the family (married men, men widowed or divorced, widows), age at census of the head of the family, occupation of the head of the family, and duration of marriage. In the case of the special inquiry, classification is also carried out according to salary of head of family and age *at marriage*, and some detailed tables are given relating to sex, order of birth, interval between births and so forth.

The data of both inquiries emphasise the lowness of the French birth-rate. For *all* families (census inquiry) the mean number of children is 2.93: for the families of married men (excluding widowers, widows, and divorced men), 2.79, the mean number of surviving children in the latter case being 2.15. If we limit

ourselves to families of which the head is aged 50 or more, and the duration of marriage 25 years or more, the mean number of children born ranges (for the successive age groups), from 3.40 to 3.60. With the same limitations of age and duration the mean number of children born is: for employers (patrons) 3.67 to 3.71 (the figures given are the range for the age groups after 50); for employees, other than artisans (employés) 3.08 to 3.24; for artisans (ouvriers) 4.11 to 4.21. The employees other than artisans have markedly the lowest average.

In the special inquiry, the employees other than artisans showed averages of 1.98 children born, 1.60 surviving; the artisans 2.61 born, 2.08 surviving—all families that is without limitations of age or duration. For a given duration the families of artisans are the smaller, on the average, the higher the salary, but this does not hold for other employees. An interesting investigation is given as to mortality in respect of order of birth, but as this has already been published in the *Journal* by M. March, in his paper on the Factors of Mortality, further attention need not be directed to it here. G.U.Y.

3.—*Illustrierte Deutsche Statistik. Diagramme und Stufenkarten. (System Kowatsch.)* Von Ambr. Kowatsch. xxviii + 140 pp., 8vo. Berlin: Puttkammer und Mühlbrecht, 1912. Price 7 mks. 50 pf.

The bulk of this book consists of a series of cartograms representing a great amount of information respecting the distribution of population, agricultural and industrial undertakings, &c., in Germany. The charts are based on official statistics, which are not reproduced in the book. But emphasis is laid not so much on the information conveyed by the charts as on the method, or "system," invented by the author, on which the charts are constructed. Statistical atlases in colour are said to possess many disadvantages, such as costliness of production, limitation of the colour schemes, and so on. In the atlas under review, all the charts are in black and white, and, by various shadings and other simple devices, the German states are arranged in twelve (or less) groups under each class of facts represented, and exactly the same scheme of shading, &c., is applied throughout, so that, for example, black always represents the first group, small open circles the tenth group. The uniform application of this scheme, when once learnt, facilitates the rapid comprehension of the charts, but, of course, reference has still to be made to the key to each chart if the facts are to be reduced to numbers. The irregular limits assigned to the groupings in many of the charts make reference to the key more frequent than might otherwise have been necessary. A.D.W.

4.—*Die Fleischversorgung des Deutschen Reiches. Eine Untersuchung der Ursachen und Wirkungen der Fleischteuerung und der Mittel zur Abhilfe.* Von Dr. Joseph Bergfried Esslen. xiv + 289 pp., 8vo. Stuttgart: Ferdinand Enke, 1912. Price 7 marks.

The question of the price and future supply of meat is far from being a purely academic one for many European countries, and

Dr. Esslen is not the first writer to consider the question in relation to Germany. There is no disputing the rise in the price of meat in that country in recent years; figures are given (pages 261-2) showing that it has been greater in Berlin than in London. Dr. Esslen attributes the rise, on the demand side, to the growth of the German population, the increase in the individual's need for meat, due partly to physiological causes, to the industrialisation and urbanisation of Germany, and to the growth of income. With this growing demand, the domestic supplies of Germany have not kept pace, partly owing to the greater profitableness, under the present tariff system, of agricultural production over animal breeding, while imports are restricted by taxes and health regulations. It is true that wages have risen in Germany, but in many cases they have lagged behind the rise in prices, and the high price of bread and other food-stuffs limits the purchasing power of the lower classes for meat. The result is declared to be insufficient nourishment of large sections of the people.

It is of great importance, then, to discover ways of increasing and cheapening the meat supply. An examination of existing conditions leads the author to the conclusion that there are only two ways of any consequence, viz., either to facilitate imports by the suspension or removal of the taxes and health restrictions, or to secure a greatly increased production of fodder in Germany, which can only be done at the expense of corn production. In considering the first alternative, Dr. Esslen makes an interesting survey of the future prospects of meat production in the present exporting countries of the world. He can find no permanent source of supply for Germany in her European neighbours or in North America. The former already need their own production mostly for themselves, and in North America the increasing population and the extension of corn growing are diminishing the surplus of animals and meat available for exportation. Only in the Southern Hemisphere does there appear to be any hope of surplus supplies available for Europe. But even there, Australia is uncertain because of its droughts; New Zealand's capacity is strictly limited; South Africa's possibilities are undeveloped. South America alone is reliable as a source of meat supply for any length of time. But the world's increasing demand, and the greater cost of production (freight) as animal breeding is carried on in districts more and more removed from the sea, will still tend to drive prices up, and another factor which Dr. Esslen fears may work in the same direction is the possible monopolisation of the supplies of the exporting countries by "North American capital and monopolising talent." The policy of free imports will not, then, in the author's opinion, secure for the German people a permanent supply of cheap and sufficient meat.

Dr. Esslen is thus driven to his second alternative—how to make Germany ultimately self-sufficing as regards meat supply. Briefly, his plan is temporarily to facilitate foreign imports to meet present needs, and to arrange that after a certain period the present corn taxes shall be lowered and, at the same time, the meat taxes raised again to their present level. This scheme, it is thought, will

ultimately extend fodder and animal production at the expense of corn. Germany will then produce her own meat requirements, but be more dependent on foreign sources for her corn. She cannot be self-sufficing in both meat and corn. An important factor in deciding which of these two she shall supply completely is that, in time of war, foreign meat supplies, which must be obtained mainly from South America and British Possessions, would be much more liable to be cut off than foreign corn supplies. Dr. Esslen's investigation is extremely interesting and instructive, but we wonder whether his solution is the right one. How long, after all, could Germany remain self-sufficing as regards meat production?

Numerous appendices to the book contain a mass of information forming the statistical basis of Dr. Esslen's arguments. A.D.W.

5.—*Emile Cheysson: Œuvres Choiesies.* 2 vols. 8vo. Paris: Arthur Rousseau, 1911. Price 15 francs.

Born at Nîmes in 1836, M. Cheysson entered the École Polytechnique, at Paris, in 1854, and passed to the École des Ponts et Chaussées in 1856. Launched on his career as engineer after the three years' course at the school, his energy and ability were immediately manifested in the variety of the work—on sewers, canals and railways—with which he was entrusted, and the vigour with which it was executed. In the siege of Paris he was entrusted with the organisation of the flour-milling service, and immediately after the conclusion of the siege accepted the directorship of Creusot, at the request of M. Schneider, but stayed there for only three years. He then returned to Paris to take up the post of engineer in connection with the service of the Seine (1874-76). It was not till 1877 that he received an official post in connection with that statistical work with which his name will be associated in the minds of the Fellows of this Society. In that year he became *Chef de la statistique et de l'économie générale des travaux publics*, and almost immediately afterwards assumed the *Direction des cartes et plans*, but it should be mentioned that, during the few years preceding, he had published several papers bearing on the social and statistical questions in which he was interested—notably, his contributions to Le Play's *L'organisation de la famille*. It was during the tenure of his post that he commenced the issue of the well-known *Album de statistique graphique*. But in 1885 the *Direction des cartes et plans* was suppressed; the energy of M. Cheysson, it would seem, was even one of the contributory causes of its fall, for a Government office that answered the majority of letters by return of post was felt to be gravely lacking in prestige. The abolition of the office to which he had consecrated all his activity marked an epoch in his life; henceforward, though he passed through the normal stages of official advancement and served on many commissions, M. Cheysson devoted more and more of his time and thought to social rather than technical questions. A professorship of industrial economics was created for him at the École des Mines, which he held for twenty years, and in 1887 he also entered, as Professor of Economics, at the *École libre des Sciences Politiques*. He devoted much

work to the societies of statistics, agriculture and geography, of all of which he was at one time president, and even more to such propagandist and other societies as the *Ligue populaire pour le repos du dimanche*; the *Société française des habitations à bon marché*, and the *Ligue nationale contre l'alcoolisme*. He was elected a member of the Académie des sciences morales et politiques in 1901, and continued his activities even after his retirement from administrative work in 1908, almost up to the moment of his death in February, 1910.

We have given this brief sketch of a life of ceaseless activity, founded on the admirable detailed biographical notice at the commencement of these volumes, partly because it will indicate to those who are familiar with one side only of his work that they must not expect to find in these selected papers by M. Cheysson a collection of purely statistical memoirs. Only two of the four papers in Vol. I can in fact be called strictly statistical; a lecture on the methods of statistics, and another on "*la statistique géométrique*" (*not* graphic method, but the application of geometric methods and statistical data to the determination of the most advantageous prices or rates). The introduction to "*Les budgets comparés des cent monographies de familles*" and "*La Famille-Souche du Lavedan*," are of the school of Le Play. The nineteen papers of the second volume are lectures and addresses on social questions—Capital and Labour—the Family, the Association and the State—Alcoholism—Housing and so forth. It may perhaps be regretted that M. Cheysson never brought together into a single volume some of his scattered thoughts on statistics and sociology—"Chez-lui," as M. de Foville says in the introduction, "*l'action et l'apostolat ont quelquefois fait tort à l'écrivain*"—but this collection will do much to fill the gap, and thanks are due to those who have given their time and thought to its preparation. The bibliography, due to M. Funck-Brentano, of 35 pp., and 546 items in the first volume, will guide the reader to other portions of his work. G.U.Y.

6.—*Wealth and welfare*. By A. C. Pigou. xxxi + 493 pp., cr. 8vo. London: Macmillan and Co., 1912. Price 10s. net.

What light can modern economic analysis throw on the great question of the relation of private wealth to public welfare? This is substantially the problem treated in Professor Pigou's new book, and the subject has so many sides that the book which treats it fairly becomes almost a treatise on modern economics. After a preliminary examination of the relation of economic welfare to welfare in general, the first point examined is whether the enlargement of what Dr. Marshall has designated the "*national dividend*" connotes increased economic welfare, and the conclusion reached is that, in general, this is the case. Questions related to the shares of different persons in the new wealth annually created are then examined, and it is argued that more even distribution between different classes, provided the total is not diminished, favours economic welfare.

The influences principally affecting the magnitude and evenness of distribution of the disposable flow of new wealth are then

examined in order, the more complex of the problems presented for discussion being broken up for convenience of argument, and the results reached being duly combined with a view to the solution of the different problems presented. In some cases a definite conclusion is reached, in others it is necessary to be satisfied with the statement that "probably" the conditions under consideration result in harmony, while certain combinations are encountered which, should they be of practical importance, would, probably or certainly, prove hostile to economic welfare.

Readers are referred to the table of contents for a "brief and incomplete" summary of the course of the argument, and as this table occupies more than twenty-two pages, it will be obvious that any attempt to indicate here the way in which the subject is developed is precluded. It must suffice to say that the argument is, as might be expected from the Cambridge professor, presented with much dialectic skill, and that modern methods of analytical treatment are used with admirable effect. At the same time, it may be suggested that no small part of what is set forth might with advantage serve as the subject matter for discussion in detail, since not all his readers will be willing in every case to accept the author's judgment as to the direction in which the balance of probabilities inclines, where that direction depends on a personal estimate of the strength of influences not readily subjected to measurement of an accurate character. In guiding discussion to the really important points, however, a most important service is rendered, while even those who may ultimately differ from the author in certain particulars will be greatly assisted by his marshalling of the arguments.

The preface states that the arrangement of the book has had for its purpose, "That the main body of it may be intelligible to readers other than professional economists." In the final two pages of the book, it is quite truly urged that such studies as are undertaken in it cannot "safely be undertaken without special preparation," . . . "it needs, not only a full understanding of the theory, but also the trained judgment that can balance against one another a large number of qualifying considerations." On the whole, the view thus presented at the end of the volume seems to indicate better than that of the preface the equipment needed for a ready appreciation of the intervening pages.

A careful and extensive study of the writings of many authors is evidenced on almost every page. In one case, figures given by Mr. Ireson in *The People's Progress* are cited in a footnote with the comment:—"There are, however, no reliable statistics on which to base such an estimate," *i.e.*, of the proportion of saving to incomes of various magnitudes. Yet, though this is the view taken on p. 354, there is given, on p. 27, in the text, a table embodying the figures thus characterised, and others for the numbers of persons in the country whose incomes are within each of five classes, these numbers involving an aggregate of incomes amounting to 7,000 millions, and of savings of 800 millions annually. The comment cited from p. 354 certainly seems to apply to the table given, and

to suggest that not much advantage results from citing it in the text.

At another point (p. 89), it is argued that "the elasticity of the demand for British labour is considerably greater than the elasticity of that part of the demand which depends on British capital alone." Apparently this is based on the view that capital readily flows into any country in which a small advantage in return is offered. How far the situation may differ as between a country mainly dependent on external sources for its capital, and a country normally disposing of a part of its increase of capital by investment abroad, would appear germane to the argument, though the point is passed without notice.

When discussing the elasticity of the supply of money (p. 432), and citing from Professor Irving Fisher as to the custom in the West of the United States and Canada of paying farmers for grain in cash, it might possibly have been worth inquiring whether the great superiority in elasticity of the Canadian bank-note issues over those in the United States afforded support to the view expressed as to the effect of the lack of elasticity on the variability of prices.

In the analytical machinery used by the author, there is included a type of diagram which, though introduced as if familiar to students of economics, appears to need some formal explanation. Conditions of supply are represented by pairs of twin curves, one a supply curve, properly so called, the other a curve of marginal supply prices. The use of the latter in problems where increasing returns are assumed would appear to be open to question, while most readers would be glad of a statement of the precise difference between the conditions envisaged by the two curves in the case of decreasing returns.

One further point only will be noticed here, namely, that on p. 210 it is stated that "if the curves representing the demands in the two markets are concave . . . a monopolist with power to discriminate between them will produce less than a monopolist without discriminating power would do . . . If both are concave, he will produce more." It appears likely that one of the words "concave" should have been "convex," probably the former, but the passage as it stands is puzzling. Moreover, is it true that "demand curves are, in general, concave?" May they not well be concave at one part of their course and convex at another, and can we assert that, in the neighbourhood of actual conditions, the former is the "general" shape?

These few criticisms may serve to illustrate an earlier remark, namely, that the acute and elaborate analysis presented by Professor Pigou may profitably stimulate to much careful discussion of the separate parts of the problem the various sides of which he has admirably presented in relation to each other. The general nature of the conclusions reached may not be greatly affected by some reconsideration of certain details or re-distribution of emphasis. The recurrence of the phrases "it is obvious," "it is evident," &c., is rather suggestive of certain mathematical works once familiar in Cambridge, in which, often without adequate reason, these phrases

aroused suspicion of the argument. As in their case, so also in this, it would be well if readers would return to the passages in question and assure themselves that they are in agreement with the author when he thus takes short cuts to conclusions not doubtful to himself.

A.W.F.

7.—*History of Economic Thought*. By Lewis H. Haney, Ph.D., xvii + 567 pp., 8vo. New York: The Macmillan Co., 1911. Price 8s. 6d. net.

This book, admirably planned and felicitously written, fills satisfactorily a gap which has long remained open, or has at any rate been hitherto imperfectly closed, in English economic literature. In France it is true that within the last few years a formidable rival to Professor Haney's "critical account," as he describes his treatise by its sub-title, "of the origin and development of the economic theories of the leading thinkers in the leading nations," has appeared in a comprehensive volume proceeding from the very capable, erudite and judicial pens of M. Gide and M. Rist, writing in collaboration but owning individual responsibility for separate chapters of their *résumé* of the genesis and growth of economic thought. And, if we went back more or less considerable a distance into the past we should discover such historical accounts of the notable contributors of preceding times, and such comparative estimates of contemporaneous authors belonging to different countries, as those furnished in the reprint of Ingram's famous article from the *Encyclopædia Britannica*, or in the translation of Cossa's *Guide to the Study of Political Economy*. Students, indeed, of the Bibliographical Note appended to the present volume will find mentioned therein other books of older date and of different languages which have been consecrated to the same subject. But we have no hesitation in affirming that the work before us has superseded all previous English treatises. Alike for its fulness and impartiality, and for the simple conclusive reason that its competent and learned author is thoroughly abreast of the latest products of systematic thinking on economic topics in Germany and in Italy, in England and in France, as well as in his own country across the Atlantic, this result has been accomplished.

Of the chief schools now extant, and of their leading exponents, he gives an apt summary in the fourth and last of the four main divisions of his book. The other three divisions consist of a brief but adequate General Introduction, dealing with the nature and importance of economic thought, describing its origin, and accounting for its tardy development, of a longer succeeding section reviewing the earlier course of such thought before what could properly be called a systematic science of Economics had arisen, and of a full review in the main body of the treatise of the subsequent "evolution of Economics as a science." In discussing the preliminary attempts which preceded the more complete and methodical achievement that deserved the title of "scientific" the ancient dispersed reflections of the Hebrews and the Hindus, of the Greeks and the Romans are sufficiently considered, and from mediæval economic meditations our author passes to what he appropriately styles the "dawn o

modern economic thought" in the Mercantilists, and those German Kameralists who resembled but also differed from the Mercantile writers. The largest and most important part of his book is no less happily planned than are the other portions. We start with the "founders" of economic science in the persons of the Physiocrats and Adam Smith. Among their "earlier followers" Malthus and Ricardo may be said to represent "pessimistic tendencies" while Carey and Bastiat display on the other hand "optimistic" inclinations. Senior in England, and Rau and von Thünen on the Continent of Europe are noticed separately, as they deserve, in a third sub-division. The "opponents and critics" are then classified as "individualistic," like Lauderdale and Sismondi, as "nationalist," like List and Carey, or as "socialistic," like St. Simon, Fourier, Owen, Thompson and Proudhon. With John Stuart Mill we have a "re-statement" which provokes in its turn fresh opposition and new criticism. This hostility now directs its assault at different points. The "scientific" Socialists—Rodbertus, Lassalle, and Marx—quarrel with the philosophical and ethical system; the historical school attacks the method pursued, and Roscher, Hildebrand and Knies, at an earlier time, and Schmoller, Bücher and Schäffle later, find supporters or sympathisers in England in Richard Jones, Bagehot and Cliffe Leslie, in Ingram, Toynbee and Thorold Rogers. Yet a third line of assault led by Lauderdale and Hermann, and the critics of the wage-fund theory, dislikes and mistrusts and rejects the logic either in general or in detail. Finally "attempts at reconstruction" introduce the reader; under Professor Haney's skilled guidance, to the "marginal utility concept" as represented by Lloyd, Gossen, Jevons and Walras, and by the Austrian economists.

In this way he contrives to illustrate the continuity of the successive phases of economic thought, and at the same time he is enabled to preserve the interest of his narrative. We have searched in vain, and we rejoice at our failure, for any lack of due appreciation of the varying qualities of the divers writers with whose essential thoughts he brings us thus agreeably into contact. Nor have we found any betrayal, conscious or unconscious, into that pronounced distorting bias which is so great and so constant a defect in what was probably before this book made its welcome appearance the best account in the English tongue of the history of economic thought. The American Professor is not indeed afraid to indicate merit or to proclaim demerit; but he is a judge and, not like Ingram, an acknowledged partisan. His book, we repeat, is in our opinion, indispensable to English economic students; and on their behalf we venture to express our sincere gratitude for the care and the ability, the learning, discrimination and vigour, which have been happily brought to its successful composition. L.L.P.

8.—*Histoire du commerce de la France*. Par E. Levasseur. Deuxième Partie: de 1789 à nos jours. xlv + 860 pp., avec 13 tableaux graphiques, 8vo. Paris: Arthur Rousseau, 1912. Price 12 francs.

This volume, which was left so complete by the distinguished

head of the Collège de France that the task of M. Deschamps, to whom its publication was entrusted, could be confined almost entirely to press revision, brings to an end the great series of Professor Levasseur's studies in the economic history and present structure of his country which has given us *L'Histoire des Classes ouvrières et de l'Industrie en France*, *La Population française*, *La France et ses Colonies*, and now *L'Histoire du commerce de la France*. Important and valuable in itself, it is a remarkable achievement to come at the end of so long and strenuous a life.

The volume falls into three parts. The first, covering 344 pages, surveys the history of French foreign trade, and the forces which have determined its course, during the period from the commencement of the great Revolution to the fall of the Second Empire; the second, covering 292 pages, treats similarly, and at almost equal length, of a period only half as long, from 1871 to 1909 (or in isolated instances even later years). The third part, described as a "résumé d'ensemble et comparaisons," includes a sketch of the theories upon foreign trade held at various times during the last century and a quarter by divers schools of economists; a description of the existing means of communication within France, and of the economic and social effects of their development; an account of the principal ports of France; and a survey of the general nature of her foreign trade as a whole, of her relations with her chief customers, and of their economic progress in comparison with her own. The comprehensive nature of M. Lévasseur's posthumous work is, however, scarcely sufficiently indicated by this description of its contents; we may add that it contains a very detailed narrative of French colonial expansion during the century (over 90 pp. are devoted to this branch alone of the economic history of the Third Republic); a useful summary of French commercial institutions, including the chambers of commerce and commercial tribunals; much information as to the great emporia of Paris and the "multiple shop" concerns of Paris and the provinces; short *résumés* of the economic doctrines (so far as they relate to foreign trade) of four distinguished French economists (MM. Cauwès, Gide, Colson and Leroy-Beaulieu); and accounts of the various changes in the customs tariffs of France and the controversies which have raged around them. Much of the contents of this almost encyclopædic work will doubtless be familiar to students of particular subjects covered by it; in the nature of the case it was not possible for it to contain much that would be unfamiliar to economists and statisticians; but the author has marshalled a great mass of information and presented it with all his familiar genius for lucidity and impartiality, and the book, quite apart from its utility, seems to us to have certain features of especial interest.

We have just mentioned M. Levasseur's impartiality. That was a dominant characteristic of all his work, and the anxiety to avoid any appearance of bias—an anxiety so pronounced as to make his narrative sometimes almost colourless—is evident in the volume before us. His comment on the tariff controversy of 1868, *à propos*

of certain industrial statistics which he quotes, is equally applicable to more recent discussions: "Ces chiffres n'étaient pas tous connus. Ceux qui l'étaient furent interprétés différemment suivant l'opinion préconçue des auteurs, qui, dans le mouvement complexe et divers de la production et de l'échange, pouvaient chacun les glaner à leur gré pour en émailler leur thèse. On les semait dans les discours, les conférences, les brochures, surtout dans les articles de presse. Les libre-échangistes annonçaient d'un ton un peu emphatique la vie à bon marché, dont ne s'apercevaient guère encore les acheteurs au détail; les protectionnistes, tirant argument des fabriques qui mal situées ou trop mal agencées se fermaient, prédisaient la débacle générale au moment où la production augmentait." But in spite of the attempt to mete out impartial justice, the careful reader of this volume will, we think, be left with little real doubt as to the author's own economic tenets. His sympathy was clearly with the commercial aims of the Third Napoleon—the whole modern tariff policy of France was in fact repugnant to him (pp. 678-9); he views recent financial, industrial and social legislation with considerable doubt (pp. 356-9); he is critical of tropical colonisation and under-estimates, in our judgment, the amount of sympathy with, and understanding of, the native races which some Europeans, at least, have brought to the task (p. 490); he appears even to dislike the current rise in the standard of living because it checks the rate of saving and the increase in national capital (p. 368).

To an observer holding these opinions the outlook is not cheering. Throughout M. Levasseur's final volume, as in some other recent economic studies of France by Frenchmen, there is a strain of discouragement. The non-expansion of the population is a constant trouble; in M. Levasseur's case there is added a distrust of French democracy, the conviction that there is little likelihood of France modifying the commercial policy which she has pursued during recent years, and alarm at the growing burdens of the Empire; and the volume ends on a note of marked pessimism. P.A.

9.—*Agricultural organisation: its rise, principles and practice abroad and at home.* By Edwin A. Pratt. xii + 259 pp., 8vo. London: P. S. King and Son, 1912. Price 3s. 6d. net.

Mr. Pratt's earlier works on questions of organisation, and the transition of agricultural conditions and agricultural practice, will have prepared the readers of this latest volume for the type of the arguments now submitted by the writer advocating the principles of combination and co-operative action in what is still the most important industry of the United Kingdom. The voluntary efforts long continued and slowly progressing over the last two decades, and here minutely recorded, will be of service to the student, alike from what it is shown has been attempted, and from the lessons revealed of frequent failures in the endeavour to place co-operative agricultural trading on a businesslike and profitable plane.

The information collected in these pages is, we are told, mainly based on a memorandum drawn up by Mr. Pratt, and presented

to the recently reconstructed Agricultural Organisation Society in October last. Very appropriately, therefore, the volume is dedicated to Mr. Robert Yerburgh, M.P., the President of that Society, and the indefatigable promoter for twenty years past of organised self-help and mutual co-operation as distinguished from earlier efforts at agricultural combination on more or less political lines.

Much of the matter before us may no doubt be found in the scattered literature supplied by the reports of the societies engaged in the propaganda, in the official records of the co-operative extension apparent among our continental neighbours, and in the unattractive columns of official blue books at home; but Mr. Pratt's labour in collecting these figures and tracing the chequered history of the movement may be commended as useful at a time when more distinctive State help is being given to the machinery employed in the effort to convert the British agriculturists to a firmer belief in co-operative trading. But, when this is said, a candid reviewer, looking at this work from a purely statistical point of view, must admit a lack of novelty in the presentation of the data. A closer grouping of the facts which would bring into relation the precise numbers and relative magnitude of the units of agricultural control in foreign states, and the proportion of such units already adopting co-operative methods abroad—a comparison of the volume of trade co-operatively handled with that of the still larger totals still conducted otherwise—would have been welcome. Mr. Pratt no doubt recognises, as some of the more sanguine co-operators have not, the essential difference in the grouping of British farmers and the traditions of their industry, which offer difficulties not encountered among the masses of more uniformly graded cultivators abroad, but perhaps even he does not fully measure the strength of the custom which leads the British farmer, small as well as large, to love the lengthy process of individual bargaining in the sale of his products, the joys of the market-place, which many will reluctantly surrender, and the distrust of credit systems which open private financial matters to neighbour's eyes. Mr. Pratt has done service in reproducing and rescuing from undeserved obscurity many of the significant data relating to the items of British agricultural production, recently published under the Census of Production Act. These have attracted far too little notice hitherto. But even he somewhat fails to recognise the relative magnitude of the mass of *unsold* production in which the farmer is still concerned. This dwarfs the scope of the products in which co-operative selling can operate. Like the majority of the present-day writers, he also, perhaps unduly, magnifies the future opening for *petite culture* in Great Britain, even if the present political efforts for its artificial extension should attain greater dimensions than are yet visible.

P.G.C.

10.—*Co-operation in agriculture*. By Henry W. Wolff. ix + 378 pp., 8vo. London: P. S. King and Son, 1912. Price 6s. net.

In this volume Mr. Wolff, the veteran writer on Agricultural Co-operation, sums up in compact form the results of his long study

of the subject, and describes in sufficient, but not excessive, detail the working of the different forms of the movement in the various European countries in which it has proved so great a success. He has, more than in some of his previous books, avoided the use of foreign terms, but it would have made it still more readily understood by the ordinary English reader if he had carried this plan further and in every case given the meaning in English of the expressions used, and put his statistics into their English equivalents, as few readers can, at a glance, take in exactly what is meant by so many francs, crowns or marks, hectares or kilogrammes, or spare the time to work out the necessary calculations for themselves. He has, under each head of Co-operation, not only described the experience of the different countries, but called attention to the principles which that experience has shown to be most salutary and efficacious, and has all through borne in mind its application to the agricultural conditions of this country, with a view to suggesting how our farmers and small holders can best utilise the lessons to be learned from combination among agriculturists elsewhere, and so secure for themselves some of the manifold advantages, direct and indirect, which it has conferred upon their fellows. He rightly lays stress upon the great importance of a thorough, practical education in co-operative principles and methods, and for such an education this book itself will be found a valuable aid.

Mr. Wolff is a consistent opponent of State interference in Co-operation, and omits no opportunity of pointing out the dangers of such action, especially when it takes the form of "coddling" societies by grants of money; and yet he must be constrained to admit that the marvellous development of the co-operative movement in several European countries, which he describes, would not have been attained in so short a period without some such assistance from the State, and that the rapid growth of co-operative credit in India, which is one of the most promising features in the recent economic history of that country, is mainly due to the Government having placed at the disposal of the illiterate Indian peasants the services of its officials for the guidance of the new societies on sound lines.

All who are interested in the welfare of the classes engaged in agriculture in this country will find *Co-operation in agriculture* a useful and suggestive handbook on the subject with which it deals.

J.W.

11.—*The Exchequer in the Twelfth Century*. By Reginald L. Poole, M.A., LL.D. xii + 196 pp., 8vo. Oxford: Clarendon Press, 1912. Price 6s. 6d. net.

The earlier history of the old Exchequer Department, which endured without much modification for eight centuries, has of recent years engaged the attention of several competent scholars. Its later history, since the time of the Restoration, culminating in its final abolition by an Act of William IV in 1834, has been referred to in these columns in an article which appeared in Vol. lxxv for 1911 (pp. 63 *et seq.*). As to the beginnings of the Exchequer, the

massive work of Thomas Madox, first published in 1711, was for a long time the only available source of information. But the publications of the Record Commission helped to make the subject clearer, and the issue in 1902 of the Oxford Edition of the famous *Dialogus de Scaccario*, written about A.D. 1179 by Richard Fitznigel, afterwards Bishop of London, was a great step in advance. Dr. Poole chose the *Dialogus* as the text for his Forde Lectures given at Oxford in Michaelmas term 1911, and he has since expanded his lectures as delivered into a book which is full of interest as well as learning. He discusses in turn the manner in which money was paid into the Exchequer and the complicated system of account in vogue there: the source from which this system was derived and the organisation by which it was carried out on the part of the central administration and of the local officers: and touches on the Exchequer as a court of law.

Originally the Exchequer Board had been constituted on the principle that the King had control of the financial administration by means of his own secretary, the Chancellor, assisted by the clerk and writer of the latter. The Chancellor was at one time a very important person at the Exchequer Board, "without whose consent or counsel nothing of importance is done or ought to be done," and he sat on the left of the chief justiciar, "the first man in the realm." But about A.D. 1199 a separate Department of Chancery was established, and the Chancellor withdrew from regular attendance at the Exchequer Board. He left behind him his clerk, who, according to the *Dialogus*, "corrects and seals the summonses, and has infinite labour, chiefest after the Treasurer," his chief function being indeed to act as a check on the Treasurer in place of the Chancellor.

This clerk, so far from being a representative of the Chancery, became one of the chief officers of the Exchequer, and in course of time was given, in the reign of Henry III, the title of Chancellor of the Exchequer. The control of the Exchequer by the Chancery having ceased to exist, its place was taken by two remembrancers, who were in origin confidential servants whom the King deputed to watch the accounts. They became instead officers of the Exchequer, and so far as the work of detail and routine was concerned, they executed most of the duties which had once belonged to the Treasurer. As the Treasurer ceased more and more to act in matters of finance, the Chancellor of the Exchequer rose to a position of still greater power, until he became (and is now) the virtual head of the Treasury Department. He still performs, however, one of his old duties as an officer of the Exchequer when he assumes the robe of a baron of the Exchequer, and sits on the Bench once a year to prepare the list of persons from whom the high sheriffs of the counties are to be "pricked" by the Sovereign. E.C.

12.—Other New Publications.*

Alberti (Mario). Il movimento dei prezzi e dei salari nell'anno 1911 a Trieste con cenni introduttivi circa un programma di futuri lavori statistici, confronti internazionali delle condizioni di vita e di lavoro degli operai ed un'appendice bibliografica. (Pubblicazioni del Museo Commerciale di Trieste.) 114 pp., Svo. Trieste, 1912. Price 4 corone.

[A statistical study of the movement of prices and wages in Trieste, by means of index-numbers, with comparative statistics for other countries and an international bibliography.]

Allen (Sidney E.). The Diagrammatic presentment of the Accounts of Local Authorities. 60 pp., la. Svo. London: Gee and Co., 1912. Price 7s. 6d. net.

[An attempt to show by means of diagrams the principal financial and statistical facts relating to the administration of a large city (Sheffield). The study is based on the city's published accounts and gives additional information not usually found in such accounts.]

Augé-Laribé (Michel). L'Évolution de la France agricole. (Le Mouvement Social Contemporain.) xvii + 304 pp., sm. Svo. Paris: Armand Colin, 1912. Price 3 fr. 50 c.

[A study of the economic conditions of agriculture in France, and of changes therein in recent years. The book also deals with the size and distribution of holdings, rural depopulation, co-operation and the development of agrarian socialism. Incidentally the author criticises the French official agricultural statistics on the score of incompleteness and leisureliness.]

Baird (William), F.S.A. Scot. The One Pound Note. iv + 72 pp., Svo. Edinburgh: Andrew Baxendine, 1912. Price 2s. net.

[This book was originally issued in 1885 as an analysis of the evidence given in 1875 before the Select Committee of the House of Commons on Banks of Issue. Although the Blue Book affords perhaps the most comprehensive body of facts and opinions bearing on the banking system of the three kingdoms that has ever been published, the size of the volume renders it practically useless to the general public; the object of the author was to place its facts and figures in a compact form. In the present edition the text has been revised, and the statistics have been brought up to date.]

Barbour (Sir David), K.C.S.I., K.C.M.G. The standard of value. xvi + 242 pp., Svo. London: Macmillan and Co., Ltd., 1912. Price 6s. net.

[Sir D. Barbour, who has been connected with the financial department of the Indian Government and was a member of the Royal Commission on Gold and Silver, describes the circumstances of the introduction of the gold standard into India. The book, among other subjects, deals with the quantity theory of money, and the relation between credit and prices.]

Beddoe (John), F.R.S., &c. The Rhind Lectureship in Archæology. The Anthropological History of Europe. Being the Rhind Lectures for 1891 revised to date. 192 pp., Svo. Paisley: Alexander Gardner, 1912. Price 6s. net.

[The late Dr. Beddoe considered a new edition of his lectures was required, not only because of the lapse of time (twenty years), but also because of recent discoveries which had either confirmed or rendered more problematical some of the views expressed in his earlier book.]

* See also "Additions to the Library," page 250, *sqq.*

Denham (E. B.). Ceylon and the Census of 1911, being the Review of the results of the Census of 1911. viii + 538 pp., 8vo. Colombo: H. C. Cottle, 1912. Price Rs. 10.

[A general and historical description of the past and present condition of Ceylon, based on the recent and earlier censuses of the country. One of the features of the last census was the keen interest taken in it by all races in the colony. People journeyed long distances to their homes, in order not to be omitted, there being a widespread impression that to be omitted from the list would bring misfortune.]

Ely (Richard T.). Monopolies and Trusts. xl + 284 pp., sm. 8vo. New York: Macmillan and Co., 1912. Price 2s. net.

[The author does not claim that this volume is a complete statement of the subjects discussed. It is a small part of a larger work of which the parts are closely related, and the book suffers somewhat in being thus published.]

Humbert (Sylvain). Le Mouvement Syndical. Histoire des Partis Socialistes en France. 98 pp. sm. 8vo. Paris: Marcel Rivière and Co., 1912. Price 75 centimes.

[A short account of Trade Unionism in France and of its relations with, and regulation by, the State. The modern tendencies of Trade Unionism in its relations to Socialism, and the revolutionary character of some of its recent activities, are also described.]

Lescure (Jean). Hausses et Baisses générales des Prix. 42 pp., 8vo, Paris: Larose et Tenin, 1912. Price 2 francs.

[A reprint of his article in the *Revue d'Économie Politique* on the rise and fall of prices in recent years and of the causes thereof.]

Müssig (Emil). Preisentwicklung in der Montan-Industrie seit 1870 mit Berücksichtigung besonderer Einflüsse, gegeben durch die technischen Fortschritte, sowie durch die Politik der Einzelwirtschaft und des Staates. vii + 113 pp., sm. 8vo. Augsburg, 1912.

——— Preisentwicklung in der Montan-Industrie . . . 1870-1920. Large sheet, rolled. Augsburg, 1912.

[A statistical study of prices and production in the mineral industry in Germany and other countries from 1870.]

Nogaro (Bertrand). Éléments d'Économie politique. Production—Circulation. vii + 388 pp., sm. 8vo. Paris: Giard et Briere, 1913. Price 6 francs.

[This book, intended primarily for students, aims at giving a general idea of the mechanism of economic life and of its working in contemporary society. It is conceived on the traditional lines of such treatises and will be completed in a later volume. The present volume deals only with production and distribution.]

Passy (Louis). Histoire de la Société Nationale d'Agriculture de France. Tome 1. 1761-93. viii + 470 pp., 8vo. Paris: P. Renouard, 1912.

[On the occasion of the 150th Anniversary of this Society, the author promised to write its history, and the present volume represents the first instalment of his work, which is to be completed in a second volume. As he remarks, it is not a history of French agriculture, but of the Society and its labours for the improvement of agriculture. The book is divided into twelve chapters, the last dealing with the Society's temporary suppression during the French Revolution, when so many of its members, including Lavoisier, perished on the scaffold.]

Pratt (Edwin A.). The State railway muddle in Australia. viii + 164 pp., 8vo. London: John Murray, 1912. Price 2s. 6d.

[A study of the working of railways by the State in Australia which the author thinks may fairly be compared with the possible experiences of the nationalisation of railways in the United Kingdom. The author reminds us that the experiences of Australia in this matter are of closer concern to this country than the corresponding experiences of Germany, "where the railways can be worked with greater freedom from undue political or labour influences."]

Stechele (Johann). Über die Bewegung der Landwirtschaftlichen Güterpreise in der Oberpfalz 1900 bis 1910. Zugleich ein Beitrag zur Frage der Beziehung von Bodenpreis und Schutzzoll. vii + 147 pp., 8vo. Munich: J. Lindauersche Buchhandlung, 1912.

[A statistical study of changes in prices of land and agricultural produce in the Upper Palatinate of Bavaria in 1900 to 1910, and their relation to customs duties.]

Tawney (R. H.). The Agrarian Problem in the Sixteenth Century. xii + 464 pp., 8vo. Longmans, Green and Co., 1912. Price 9s. net.

[A study of the agrarian conditions in the 16th century and of changes during that period which caused much distress among the peasantry. The authors originally intended to include an account of the relations of the State to trade and manufacturing industry, but found the material too abundant to be treated in a single work. The present work is divided into three parts dealing respectively with the small holder; the transition to capitalist agriculture; and the outcome of the agrarian revolution. Such statistical tables as are contained in the volume have been included only after considerable hesitation, and their faults and ambiguities are pointed out in an appendix. There is a good index.]

Watney (Charles) and Little (James A.). Industrial Warfare. The aims and claims of Capital and Labour. x + 353 pp., 8vo. London: John Murray, 1912. Price 6s. net.

[The primary object of the authors has been to supply an epitome which may explain to the ordinary reader the exact significance of the growing industrial unrest, and serve as a supplement to the detailed and specialised literature of the various aspects of the whole question.]

Woolf (Arthur H.). Short history of Accountants and Accountancy. xv + 254 pp., 8vo. London: Gee and Co., 1912. Price 7s. 6d. net.

[A revised and augmented reprint of articles which have appeared in *The Accountant*. The author's endeavour has been to collect and present in a connected form the facts relating to the history of accounting to be found in numerous works. A list of the authorities consulted is given, and also a bibliography arranged in chronological order and going back to 1494.]

Belgium. Instituts Solvay. La politique de réforme sociale en Angleterre. Conférences de l'"Eighty Club." xv + 191 pp., 8vo. Brussels: Misch et Thron, 1912.

[Contains the text of four addresses delivered at the Institute by different members of the "Eighty Club" dealing with the Agrarian, Political, Industrial and Fiscal policies of the United Kingdom, with the discussions thereon.]

Germany's Economic Forces. Presented by the Dresdner Bank, Berlin . . . 48 pp., 8vo. 1913.

[A useful compilation of facts and figures taken from authentic sources, showing the economic progress of Germany compared with certain other countries during recent years.]

Russia. Company Fire Insurance in Russia, 1827-1910. 142 pp., fol. St. Petersburg: The Tariff Committee of Russian Insurance Companies, 1912.

[The compilers believe that this is the first account printed in English of fire insurance business in Russia. They remark on the varying degree of accuracy of the statistics for different periods: those for 1827 to 1883 belong to a period too remote to allow of their verification; those for 1884 to 1897 cover a period when the statistical system was being re-arranged and are affected thereby, the later figures being the most accurate. The book is divided into five chapters, and there are numerous diagrams and cartograms.]

Institut International d'Agriculture. Étude méthodologique et statistique sur les recensements de la population agricole, les salaires de la main-d'œuvre rurale et les courants d'émigration dans les différents Etats. xi + 150 pp., fol. Rome: Officina Poligrafica Italiana, 1912.

[A most useful compilation drawn up by Dr. A. Caroncini for the use of the Institute, giving the sources of information in the different States adhering to the Institute, as to rural population, wages paid to agricultural labourers, and the extent of immigration.]

CURRENT NOTES.

The trade returns continue to show an increase both of imports and exports. The subjoined tables compare the returns of the twelve months ending December, 1912, with the twelve months ending December, 1911:—

[000's omitted.]

Imports.	Twelve months ending December, 1912.	Twelve months ending December, 1911.	Increase (+).
Imports, value c.i.f.—	£	£	£
I. Food, drink and tobacco	280,764,	263,958,	+ 16,806,
II. Raw materials and articles mainly unmanufactured	275,713,	248,159,	+ 27,554,
III. Articles wholly or mainly manufactured	185,501,	165,557,	+ 19,944,
IV. Miscellaneous and unclassi- fied (including parcel post)	2,918,	2,483,	+ 435,
Total merchandise	744,896,	680,157,	+ 64,739,
Imports of bullion and specie	69,467,	62,988,	+ 6,479,

[000's omitted.]

Exports.	Twelve months ending December, 1912.	Twelve months ending December, 1911.	Increase (+).
Exports of produce and manu- factures of the United Kingdom, value f.o.b.—	£	£	£
I. Food, drink and tobacco	32,690,	29,038,	+ 3,652,
II. Raw materials and articles mainly unmanufactured	59,428,	53,726,	+ 5,702,
III. Articles wholly or mainly manufactured	385,219,	362,222,	+ 22,997,
IV. Miscellaneous and unclassi- fied (including parcel post)	10,097,	9,133,	+ 964,
Exports of foreign and colonial merchandise, value f.o.b.—			
I. Food, drink and tobacco	15,094,	14,311,	+ 783,
II. Raw materials and articles mainly unmanufactured	67,388,	59,958,	+ 7,430,
III. Articles wholly or mainly manufactured	29,187,	28,345,	+ 842,
IV. Miscellaneous and unclassi- fied (including parcel post)	168,	145,	+ 23,
Total, British, foreign and colonial	599,271,	556,878,	+ 42,393,
Exports of bullion and specie	64,871,	57,024,	+ 7,847,

[000's omitted.]

Shipping.	Twelve months ending December, 1912.	Twelve months ending December, 1911.	Increase (+).
	Tons.	Tons.	Tons.
Total, British and foreign, <i>entered</i> } with cargoes	46,348,	41,946,	+ 4,402,
Total, British and foreign, <i>cleared</i> } with cargoes	62,010,	59,263,	+ 2,747,

Mr. Sauerbeck's index-number of prices for December, 1912, is 86·4 as against 85·3 in November, the average of the eleven years, 1867-77, being taken as 100. The index-number is 5 points higher than in the previous year, and is 15 per cent. below the standard period, which was equivalent to the average of the twenty-five years 1853-77, but it is 29 per cent. above the average of the lowest decade, 1890-99. Articles of food were 78·4 as compared with 77·3 in November, and materials 92·2, as compared with 91·2. The *Economist* index-number stands at 2,747 as compared with 2,721 in November, 2,586 in December, 1911, and 2,503 in December, 1910.

According to the Board of Trade *Labour Gazette* the state of the labour market last November was as follows:—

	Trade Unions making returns. Net membership.	Reported as unemployed.	
		Number.	Percentage.
November, 1912.....	887,350	16,142	1·8
October, 1912	885,100	17,822	2·0
November, 1911.....	800,532	20,540	2·6

Employment improved in November, especially in the ship-building and printing trades, on the other hand there was a seasonal decline in building and brickmaking. The percentage of trade union members unemployed was the lowest recorded during the past ten years. It is reported by the Labour Exchanges that there was a large demand by employers for workmen of all classes in the shipbuilding trade, and that in the engineering and metal trades there was a scarcity of workers in some districts. In the case of women the demand exceeded the supply in the cotton, woollen and worsted, linen, jute and clothing trades and in laundry work. The upward movement in wages continued. Compared with a year ago all the principal industries showed an improvement, which was most marked in the pig iron, iron and steel, engineering, glass and brick trades.

A Report has been issued by the Board of Trade on Profit-sharing and Co-partnership in the United Kingdom [Cd-6496, price 8½*d.*]. The work of investigation was at the outset entrusted to Mr. David F. Schloss, but when his work was nearing completion he was compelled to relinquish it owing to the illness which ended in his death. It is recalled that the last detailed report issued by the Department on the subject of profit-sharing was also compiled by Mr. Schloss, and was published in 1894. In this report, as in the previous one, profit-sharing is understood to involve an agreement between an employer and his workpeople under which the latter receive, in addition to their wages, a share, fixed beforehand, in the profits of the undertaking. A grant or bonus, therefore, made at the absolute discretion of an employer, and not upon any pre-arranged basis, is not a case of profit-sharing for the present purpose. It is further remarked that, without a special inquiry, it would be difficult to determine in the less well-organised trades in which many of the profit-sharing schemes have been started, whether the wages paid are the full current district rates. Labour co-partnership is defined as an extension of profit-sharing, enabling the worker to accumulate his share of profit in the capital of the business employing him, thus gaining the rights and responsibilities of a shareholder. A still further stage is found in some co-partnership schemes which provide for a direct share in the management as well as a share in the profits, one or more seats on the board of directors being expressly reserved for representatives of the workpeople. The number of schemes now known to be in operation is 133, the number of workpeople employed by the firms having such schemes being about 106,000. These 133 schemes are the survivors of nearly 300 profit-sharing arrangements of which 163 have been abandoned. The following tabular statement classifies the schemes according to date of adoption, and shows the extent to which schemes started at various periods have survived:—

Date of starting.	Total number of schemes.	Schemes abandoned.	Schemes still existing.	Schemes as to which no recent particulars are available.
Up to 1870	20	17	3	—
1871-80	18	12	6	—
'81-90	84	63	20	1
'91-1900	82	58	23	1
1901-05	27	7	19	1
'06-10	55	6	49	—
'11-12 (seven months)...	13	—	13	—
	299	163	133	3

The number of workers under existing schemes who were entitled to share in profits at the end of 1911 (or in 1912, in the case of schemes started since 1911) was 57·3 per cent. of the total number of workers in the firms where these schemes were in force. The average "bonus," or share in profits, in 1911, represented an addition to the wages of participants of 5·5 per cent. in the case of those firms who furnished particulars to the Department; this was also the average for the whole period 1901-11.

It is announced in the *Bulletin of Agricultural Statistics* that the Russian Government has addressed a detailed communication to the International Institute of Agriculture upon the organisation of the Imperial service of agricultural statistics, in the course of which it is stated that while the Government desires to contribute as far as possible to the efforts of the Institute to secure a greater uniformity in agricultural statistics, and to adopt the numerical system employed by the Institute, it will not be possible to adhere entirely to the conditions indicated without seriously reorganising this service of statistics. In the meantime the Government has decided to take all possible measures, pending a complete reorganisation, to furnish the Institute regularly and promptly with all available information, including numerical returns as to the condition of the crops and the estimate of the possible yield. At present a numerical return as to condition of crops is made only once a year during the period of vegetation; in future the original figures of this return, as well as the results of a transformation of these figures into a percentage of an average yield, will be communicated to the Institute about August 15 (new style).

The International Congress of Agriculture, which, it is announced, will be held at Ghent, from June 8 to June 13, 1913, concurrently with the International Exhibition, is the tenth of the series of periodical congresses which were inaugurated at Paris in 1889. Agricultural meetings had hitherto been organised in various countries at indefinite dates. They had no connection with each other, and their influence was merely temporary. At the congress which was held in Paris on the occasion of the International Exhibition of 1889 a permanent committee was constituted, and under the designation of the International Commission of Agriculture was charged with the duty of convening and organising congresses at subsequent dates. Under its auspices several large international congresses have been held, viz., at The Hague in 1891, at Brussels in 1895, at Buda Pest in 1896, at Lausanne in 1898, at Paris in 1900, at Rome in 1903, at Vienna in 1907, and at Madrid

in 1911. The arrangements for these congresses are made by the Permanent Commission, which meets periodically during each interval. Particulars of the congress are obtainable from Mr. Vandervaeren, one of the Assistant General Secretaries, 228, Chaussée d'Alseberg, Brussels.

The *Transactions of the Manchester Statistical Society* for 1911-12 show a record of good work done during the past session. In addition to the Presidential Address by Mr. D. Drummond Fraser, four Papers are reproduced, and there is a short article by Mr. T. A. Welton on "The marriage rate since 1880 in England and Wales." Mr. Fraser's address was on "The problem of the "gold reserve," in which it is maintained that, while we are particularly fortunate in having so much gold in actual circulation, what is needed is more gold, and less securities in the issue department of the Bank of England, in order that the ultimate gold reserve may be adequate to maintain the nation's financial supremacy. Mr. F. W. Hirst, the editor of the *Economist*, contributes a Paper on "The theory and finance of modern armaments," in which he advocates a "friendly business understanding" between England and Germany, and the adoption of a proportional limitation of navies. Mr. R. Williams deals with the problem of "The organisation of the casual labour market," Mr. C. F. Bickerdike with "International comparisons of labour conditions," and Mr. J. L. Paton, the High Master of the Manchester Grammar School, with "The adolescence of the working lad in industrial towns."

The death is announced, at the age of 55, of Dr. Ernst Mischler, President of the Central Statistical Commission of Austria. Dr. Mischler succeeded Dr. R. Meyer, on the appointment of the latter as Minister of Finance, in the spring of 1911. In the following year Dr. Mischler was elected an Honorary Fellow of the Royal Statistical Society.

It is announced by the Eugenics Education Society that a year's course of lectures on the groundwork of Eugenics will be held at the Imperial College of Science, South Kensington, from January to December, 1913. The course will be open to the public on the payment of fees, and previous University training will not be compulsory. The course of elementary biology is to meet the needs of those who have not already studied that subject elsewhere. The session will be divided into three terms, viz., January to March, April to July, and October to December. An examination will be

held at the end of each term, and certificates will be awarded to students qualifying in all three examinations, proof of having qualified in an examination in biology held elsewhere and recognised by the committee as being sufficient, being accepted as qualification in the subject in question. In the spring term, Mr. Clifford Dobell will give a course of lantern lectures on "Elementary biology, with special reference to the reproductive system," while the summer term will be occupied by a course on "Heredity (including evolution, genetics, and heredity in man)," by Mr. R. C. Punnett, F.R.S. In the autumn term, Mr. G. Udny Yule will lecture on "Statistical methods applied to some problems in eugenics." This course will deal primarily with the statistical methods of greatest importance to the student of eugenics, the practical calculation and the interpretation of the constants involved. Examples of the application of such methods will be drawn, as far as possible, from recent work, and some problems of special interest will be considered in detail, as illustrations in the latter part of the course. A knowledge of elementary algebra will be assumed. Exercises may be given or discussions held after each lecture. Further particulars may be obtained from the Hon. Secretary, Eugenics Education Society, Kingsway House, Kingsway, W.C.

We have received from Mr. Arthur McDonald, of Washington, a pamphlet, together with a covering circular letter dealing with "a plan to lessen or prevent crime and other abnormalities." The idea is to establish laboratories or bureaux for the scientific investigation of criminals and other dangerous abnormals. Mr. McDonald believes that every large city, every State, and especially Federal Governments, should have such a laboratory, which he considers just as necessary as a Health Department, if not more so; and he urges that when anyone sends to the President, the Governor, Mayor, or any prominent citizen threatening letters, or repeatedly utters threatening words, or attempts to injure such persons, or is unreasonably insistent in demanding to see them personally, such individual should be detained at least a few hours and thoroughly studied by scientific experts in criminal anthropology, psycho-physics and social pathology. First, the necessary measurements of head and body should be made, in accordance with the science of anthropology. Secondly, a psycho-physical study of the person should be conducted, including the measurement of the senses. Thirdly, there should be a sociological inquiry into the antecedents and history of the individual from childhood. Fourthly, a pathological study of the signs of physical, mental and moral stigmata of a generation should be conducted. By such study of dangerous, unbalanced and often

illusioned persons, who may be called mattoids, their eccentricities and peculiar behaviour under varied conditions can, it is contended, be determined to such an extent that we may detect them in advance. At present it is almost impossible to do this, because of little or no knowledge concerning them. This ignorance is traced to want of systematic investigation.

A vacancy exists in the Division of Statistics of the International Agricultural Institute for a *réducteur*, whose duties will be principally connected with the compilation of the monthly "Bulletin of Agricultural Statistics." The salary is 4,800 francs (about 190/.) per annum, with an additional payment, equivalent to 15 per cent. of the salary, towards an insurance and superannuation fund. Candidates (preferably University graduates) must be well educated, with a good practical knowledge of French, and, if possible, a knowledge of German or some other language. They should also have studied political economy and statistical methods, and practical experience in dealing with statistics will be specially considered. Applications, with copies of testimonials, should be sent to the Secrétaire-général, Institut international d'Agriculture, Rome.

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

Bankers' Magazine—

December, 1912—British gold reserves and the gold question in India.

January, 1913—Dear food, cheap Consols and labour unrest:

Pucke (C. E.). Indian currency and finance: *Murray (R.)*.

The price of consols: *Gibson (A. H.)*.

Economic Journal. *December, 1912*—Co-partnership in industry:

Fay (C. R.). Recent developments of poor relief: *Bailward*

(W. A.). Depreciation of government securities in Germany:

Cohn (Gustav). Panama Canal tolls and theory of monopoly

prices: *Hutchinson (Lincoln)*. A more stable Gold standard:

Fisher (Prof. Irving). The foreign branch banks in London:

Spalding (W. F.). Return of estimated value of foreign trade

of United Kingdom at prices of 1900: *Keynes (J. M.)*.

Obituary—David Frederick Schloss: *A.W.F.*

Proceedings of Royal Philosophical Society of Glasgow. Vol. 43,

1911-12—The future of the race. A study in present-day

aspects of social bionomics: *Glaister (Prof. John)*. Scotch

forestry: its economic aspects: *Gammell (S. J.)*. The employ-

ment of white labour in the sugar plantations of Queensland:

Gregory (J. W.).

Surveyors' Institution. *Transactions*. Part 3, 1912-13—English

timber: its markets, value and production: *Duchesne (M. C.)*.

UNITED STATES—

American Journal of Sociology. *November, 1912*—Walker's Theory of Immigration: *Goldenweiser (E. A.)*.

Annals of American Academy. *November, 1912*—The National

Civic Federation and Industrial Peace: *Low (Seth)*. Conditions

fundamental to Industrial Peace: *Hugo (G. B.)*. Attitude of

Labor towards scientific management: *Godfrey (Hollis)*. In-

dustrial Betterment Activities of the National Metal Trades

Association: *Wuest (Robert)*. Industrial peace activities of the

National Electric Light Association: *Williams (A.)*. A prom-

ising venture in industrial partnership: *Foerster (Robert F.)*.

The Standpoint of Syndicalism: *Lecine (Louis)*. Education and

Industrial Peace: *Schneider (Herman)*. Factory Organization

in relation to Industrial Education: *Diemer (Hugo)*. Industrial

Peace from the standpoint of Trade Unionist: *Golden (John)*.

Journal of Political Economy. *December, 1912*—The economic

theory of a legal Minimum Wage: *Webb (Sidney)*. Some

economic aspects of Immigration before 1870: *Page (Thomas W.)*.

Political Science Quarterly. *December, 1912*—Recent Tax Reforms

Abroad. II: *Seligman (E. R. A.)*. Marxism versus Socialism:

Sinkovitch (J. G.). Russian-American Commercial Relations:

Hogan (J. V.).

FRANCE—

Journal des Economistes. December, 1912—La réglementation du travail des employés: *Gugot (Yves)*. Frédéric List et la polémique autour de ses idées en 1912: *Raffalovich (Arthur)*. Prévisions économiques pour 1913: *Mondet (N.)*.

Journal de la Société de Statistique de Paris. December, 1912—Recherches sur les conditions économiques des ouvriers industriels en Finlande (1908-09): *Pissargersky (Mlle. Lydie)*. La Population étrangère en France (1851-1911): *Meunier (Paul)*. Etat général et comparatif du régime fiscal en France: *Salefranque (Léon)*.

La Réforme Sociale. November 1, 1912—La grève noire de 1912 en Angleterre: *Gigot (Albert)*.

Revue d'Economie Politique. November-December, 1912—Le bassin de Briey et la politique de ses entreprises sidérurgiques ou minières: *Vignes (Maurice)*. La mise en valeur d'un pays neuf.—Le Brésil et l'Industrie du Caoutchouc: *Picard (Roger)*. Le Crédit ouvrier par l'Assurance. Une Combinaison de l'épargne avec l'assurance mutuelle sur la vie: *Nabholz (P.)*. Relation entre les variations annuelles du chômage, des grèves et des prix: *Rist (Charles)*.

GERMANY—

Archiv für Rassen- und Gesellschafts-Biologie. July-August, 1912—Die Wanderungen der bayerischen Bevölkerung und ihre Einflüsse auf die Rasse: *Grassl (Dr. J.)*.

ITALY—

La Riforma Sociale, 1912—

November—Di alcune recenti teorie sul capitale sul reddito e delle loro conseguenze tributarie: *Prato (Giuseppe)*. La nominatività dei titoli al portatore e la imposta di successione: *Cubati (Attilio)*.

December—I limiti della circolazione bancaria: *Vecchio (Gustavo D.)*. Polemizzando coi Siderurgici: *Einaudi (L.)* e *Riboni (P.)*.

MONTHLY LIST OF ADDITIONS TO THE LIBRARY.

During the period that has elapsed since December 8, 1912, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

(a) Foreign Countries.

Denmark—

Copenhagen. Census. Folketaellingen for Kobenhavn og Nabokommuner den 1 Februar 1911. 23 pp., 8vo. 1912. (The Municipal Statistical Bureau.)

France—

Census. Statistique des familles en 1906. 205 pp., 4to. 1912. (The Chief of General Statistics of France.)

Finance. Résultats de la 2^e révision décennale du revenu net des propriétés bâties. (Loi du 8 août 1890 art. 8.) Rapport à M. le Ministre des Finances par M. Maurice-Bloch. Fol. 1912. (The Board of Agriculture and Fisheries.)

Colonies. Statistique des Finances des Colonies Françaises pour 1902-11. 8vo. 1912. (The French Colonial Office.)

Germany—

Labour. 5. Sonderheft zum Reichs-Arbeitsblatte. Die Tarifverträge im Jahre 1911. Nebst einem Anhang: Die Tarifgemeinschaften des Jahres 1911 im Handwerk. Fol. 1912. (Carl Heymann.)

Germany's Economic Forces. Presented by the Dresdner Bank, Berlin, on the occasion of its 40th anniversary. 48 pp., sm. 4to. Berlin, 1913. (The Bank.)

Frankfort a.M.—

Beiträge zur Statistik der Stadt Frankfurt a.M. Neue Folge. Heft 7. Untersuchung über den Stand der Lohn- und Arbeitsverhältnisse der Arbeiter und Unterangestellten im Juli 1907. Heft 8. Tabellarische Übersichten betreffend den Zivilstand der Stadt Frankfurt a.M. in 1901-10. Heft 9. Die Versorgung der Stadt Frankfurt a.M. mit Milch und Fleisch. 3 vols., 8vo. 1911. (The Municipal Statistical Bureau.)

Statistische Jahresübersichten der Stadt Frankfurt am Main. Ausgabe für 1909-10 und 1910-11. 2 vols., 8vo. 1912. (*Id.*)

Deutscher Verein für Versicherungs-Wissenschaft. Sammlung von Versicherungsbedingungen Deutscher Versicherungsanstalten. Teil 5. 8vo. Berlin, 1913. (The Association.)

Verein für Sozialpolitik. Die Vertenerung der Lebensmittel in Berlin im Laufe der letzten 30 Jahre und ihre Bedeutung für den Berliner Arbeiterhaushalt. Von Gustav Brutzer. 87 pp., 8vo. Leipzig, 1912. (*Id.*)

Luxembourg—

Census. Recensement professionnel et industriel, 1907. Tome 2. La population par professions principales et accessoires Partie I. 8vo. 1912. (The Statistical Bureau.)

Mexico—

Estadística de Inmigración formada por la Dirección General de Estadística. Numero 1.—Año de 1909. Fol. 1910. (The Director-General of Statistics.)

Netherlands—

Labour. Leknept overzicht van den omvang der Vakbeweging op 1 Januari 1912. 8vo. 1912. (The Central Statistical Bureau.)

— Statistique des salaires des ouvriers dans l'industrie textile assurés selon la loi contre les accidents du travail pendant 1908. 8vo. 1912. (*Id.*)

(a) Foreign Countries—*Contd.***Netherlands—*Contd.***

Amsterdam. Communications Statistiques, No. 40. Statistique Démographique des Grandes Villes du Monde pendant 1880-1909. Seconde Partie. Autres parties du Monde et Annexe générale. Svo. 1912. (Municipal Statistical Bureau.)

Norway—

Census. Recensement des métiers en 1910: Etablissements, chefs de métiers et ouvriers. Svo. 1912. (The Central Statistical Bureau.)

— Recensement du 1 Décembre 1910: Population des divisions administratives, &c. Svo. 1912. (*Id.*)

Finance. Finances de l'État pour les exercices 1 Avril 1905 à 30 Juin 1910. Svo. 1912. (*Id.*)

Joint Stock Companies. Sociétés par actions en 1910. Avec un aperçu du développement depuis 1891. Svo. 1912. (*Id.*)

Russia—

Company Fire Insurance in Russia 1827-1910. Published by Tariff Committee of Russian Insurance Companies. Translated from Russian by G. Dobson, Secretary to British Consulate, St. Petersburg. 142 pp., fol. St. Petersburg, 1912. (The Committee.)

Sweden—

Stockholm. Quelques données statistiques (sur la ville) . . . Sm. Svo. 1912. (The Municipal Statistical Bureau.)

United States—

Agriculture. Bulletin 94. Supply of Farm Labor. Svo. 1912. (The Department of Agriculture.)

— Bulletin 95. Imports of Farm and Forest Products 1909-11. By countries from which consigned. Svo. 1912. (*Id.*)

— Bulletin 96. Exports of Farm and Forest Products, 1909-11. By countries to which consigned. Svo. 1912. (*Id.*)

— Bulletin 99. Wages of Farm Labor. 19th investigation, in 1909, continuing a series that began in 1866. By G. K. Holmes. Svo. 1912. (*Id.*)

— Bulletin 100. Railroads and farming. Some influences affecting the progress of agriculture. By F. Andrews. Svo. 1912. (*Id.*)

— Rice Crop of United States, 1712-1911. Svo. 1912. (*Id.*)

New York (City). Reports on vital statistics and health reports of New York City. 20 pp., Svo. (The New York Academy of Medicine.)

(b) India and Colonies.

Australia, Commonwealth of—

Bureau of Census and Statistics. Professional Papers. Mathematical Analysis of some Experiments in Climatological Physiology. By G. H. Knibbs. Pp. 325-351. Svo. 1912. (The Bureau.)

— An extension of the principle underlying Woolhouse's method of graduation. By Chas. H. Wickens. 16 pp., Svo. 1912. (*Id.*)

Census, 1911. Bulletin No. 13. Localities. Fol. 1912. (The High Commissioner for Australia, 72, Victoria Street, S.W.)

Victoria. Geological Survey. Report of progress by R. Brough Smyth. Nos. 2 and 3. 2 vols., Svo. 1874-76. (The Mines Department, Melbourne.)

Canada—

Census. Fifth Census of Canada, 1911. Areas and population by provinces, districts and subdistricts. Vol. I. Svo. 1912. (The Canadian Government Office, London.)

Ceylon—

Census of Ceylon, 1911. Occupation Statistics showing occupations of the population by race and sex. By E. B. Denham, Superintendent of Census Operations. Fol. Colombo, 1912. (The Superintendent.)

(c) **United Kingdom and its several Divisions.****United Kingdom—**

Census of Production. Final report on the first Census of Production of the United Kingdom (1907). With Tables. [Cd-6320]. 1912. (The Census of Production Office.)

Labour. Report on Profit-sharing and Labour-copartnership in the United Kingdom. [Cd-6496]. Svo. 1912. (The Board of Trade.)

England and Wales—

Census of England and Wales, 1911. Families or separate occupiers, and population. Vol. 4. Ecclesiastical Areas. [Cd-6360]. 1912. (The Census Office.)

London County Council. Reports of Conference on teaching of drawing in elementary and secondary schools. Svo. 1912. (The London County Council.)

Scotland—

Census of Scotland, 1911. Vol. I. Counties of Lanark, Nairn, Orkney, Peebles, Perth. Fol. 1912. (The Registrar-General.)

(d) **Authors, &c.**

Baird (William). The One Pound Note. Its History, Place, and Power in Scotland, and its Adaptability for England, to which is added Note exchange and Clearing House system and Rules in Scotland. 3rd Edition. 72 pp., Svo. 1912. (Andrew Baxendine.)

Boas (Franz). Changes in bodily form of descendants of immigrants. xii + 573 pp., Svo. New York and London, 1912. (Henry Frowde.)

Boven (Pierre). Les applications mathématiques à l'économie politique. 204 pp., Svo. Lausanne, 1912. (F. Rouge and Co.)

Denham (E. B.). Ceylon at the Census of 1911, being the review of the results of the Census of 1911. Svo. Colombo, 1912. (The Colonial Office, London.)

Falkenburg (Dr. Ph.). Tabellen betreffend die Mortalität, Geburtenziffer, den Geburtenüberschuss und die Säuglingssterblichkeit in der verschiedenen Ländern Europas. 7 pp., Svo. 1911. (The Author.)

Finizio (Gaetano). Relazione sulla Tutela del Lattante. (Società Pediatrica Italiana.) Parte generale. 67 pp., Svo. Padova, 1912. (*Id.*)

French (R. Duncan) and Gee (A. L.). The Accountant's Pocket Diary and Reference Book for 1913. 167 pp., sm. Svo. 1912. (Gee and Co.)

Guyot (Yves). La Gestion par l'Etat et les municipalités. viii + 437 pp., Svo. Paris, 1912. (Félix Alcan.)

Marcuse (Dr. Julian). Die Beschränkung der Geburtenzahl, ein Kulturproblem. 151 pp., Svo. München, 1913. (Ernst Reinhardt.)

Risser (René). Étude sur le Coût d'Application de la Loi des Retraites ouvrières et paysannes pour le premier exercice (2^e semestre 1911). 34 pp., Svo. Paris, 1911. (Berger-Levrault and Co.)

Rosenraad (C.). Highest and Lowest Rates of Exchange on London during the First and Second Halves of 1912 on twenty-one of the principal Money Markets. Sheet. 1913. (The Compiler.)

Savoryan (Franco). Verschmelzung und gegenseitige Penetration der Rassen und Nationalitäten. Statistische Untersuchungen. 616-664 pp. incl., Svo. Tübingen, 1912. (The Author.)

Seyd (Richard). Statistics of Failures in United Kingdom during 1912. Sheet. 1913. (The Compiler.)

Wohlin (Nils). Den Svenska Jordstyeckningspolitiken i de 18de och 19de Århundradena. Akademisk Afhandling. xiii + 852 pp., Svo. Stockholm, 1912. (The Author.)

Woolf (A. H.). Short History of Accountants and Accountancy. With Bibliography compiled by Cosmo Gordon. xiv + 254 pp., Svo. 1912. (Gee and Co.)

SHIPPING.—(United Kingdom.)—Account of Tonnage of Vessels Entered and Cleared with Cargoes, from and to Various Countries, during the Years ended Dec., 1912-11-10.

Countries from whence Entered and to which Cleared.	Total British and Foreign.					
	1912.		1911.		1910.	
	Entered.	Cleared.	Entered.	Cleared.	Entered.	Cleared.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
FOREIGN COUNTRIES.						
Russia { Northern ports	2,904,672	2,535,743	2,911,457	2,337,498	2,942,723	2,187,057
{ Southern „	531,732	119,349	947,891	144,259	980,366	141,777
{ Pacific „	97,630	28,958	122,865	24,395	99,507	11,410
Sweden	1,590,014	2,497,314	1,564,690	2,387,374	1,611,570	2,428,739
Norway	1,326,778	1,625,242	1,352,622	1,509,750	1,372,728	1,530,507
Denmark	530,884	1,930,763	508,872	1,984,125	528,345	1,953,087
Germany	2,252,511	5,476,735	2,337,188	5,692,819	2,153,358	5,701,199
Netherlands	3,081,531	3,438,631	3,045,058	3,335,781	2,973,980	3,371,619
Belgium	2,975,143	2,856,497	2,256,381	2,849,815	2,237,716	2,728,774
France	3,566,495	7,166,628	2,689,154	6,531,370	2,661,163	6,189,789
Spain	2,951,441	2,101,306	2,729,122	1,965,990	3,074,799	1,884,554
Portugal	263,408	737,272	268,974	662,042	301,591	672,178
Italy	411,671	4,610,361	387,180	4,763,503	386,334	4,580,173
Austria-Hungary	91,629	493,439	82,660	601,009	88,922	563,390
Greece	123,194	300,423	182,640	336,456	192,069	269,765
Turkey	275,762	272,007	253,472	412,108	169,794	401,359
Roumania	236,153	188,175	525,704	246,375	301,610	223,192
Egypt	451,198	1,660,781	351,688	1,707,669	293,402	1,453,289
Algeria	454,275	593,456	436,338	587,391	497,686	540,403
Portuguese East Africa	236,317	445,952	244,743	407,595	131,462	461,515
United States of America	7,991,954	6,563,647	6,411,039	5,095,528	6,138,842	5,007,079
Mexico, Foreign W. Indies, and Central America	400,101	587,031	293,235	519,732	361,174	444,898
Colombia	126,898	43,823	114,927	35,332	121,506	53,197
Brazil	249,275	1,339,124	248,084	1,324,246	243,366	1,231,527
Peru	215,451	250,831	259,749	241,149	232,145	247,756
Chile	128,162	457,446	126,412	575,617	160,360	653,585
Uruguay	101,235	481,151	43,288	496,573	36,545	520,152
Argentine Republic	2,232,590	3,027,567	1,462,239	2,554,522	1,702,616	2,331,788
China	91,006	86,554	59,681	65,228	53,506	81,183
Java	169,086	201,675	114,821	285,517	115,982	268,235
Japan	509,435	770,057	517,277	704,923	597,411	700,471
Other countries	995,331	753,136	700,365	665,207	614,106	615,158
<i>Total, Foreign Countries.</i>	37,562,962	53,741,074	33,549,816	51,050,898	33,286,684	49,448,835
BRITISH POSSESSIONS.						
British North America	2,860,592	2,413,557	2,809,942	2,375,826	2,774,045	2,234,601
British India	2,370,120	1,681,521	2,067,004	1,648,428	2,095,763	1,594,856
Mauritius, Ceylon, Straits Settlements, & Hong Kong	104,560	309,428	93,837	322,745	61,880	335,310
Australia	1,295,108	1,133,772	1,386,698	1,092,988	1,247,858	980,299
New Zealand	456,984	503,490	361,999	502,120	414,449	418,201
West Indies	185,766	128,085	159,119	224,417	224,375	288,671
Channel Islands	462,648	353,625	477,526	359,732	459,576	339,048
Gibraltar and Malta	139,504	423,259	60,757	360,625	67,582	355,061
Union of South Africa	406,707	742,844	512,111	725,485	495,571	696,114
Other possessions	503,053	579,028	467,652	600,050	490,882	605,949
<i>Total, British Possessions</i>	8,785,042	8,268,609	8,396,645	8,212,416	8,331,981	7,878,113
TOTAL FOREIGN COUNTRIES AND BRITISH POSSESSIONS.						
Twelve Months { 1912.....	46,348,004	62,009,683	—	—	—	—
{ ended '11.....	—	—	41,946,461	59,263,314	—	—
December, { '10.....	—	—	—	—	41,618,665	57,326,948

Values of Imports into the United Kingdom for the Years 1910-11-12.*

[From the Monthly Trade Returns, December, 1912.]

	Year ended December 31,			Increase (+) or Decrease (—) in 1912 as Compared with 1911.	Increase (+) or Decrease (—) in 1912 as Compared with 1910.
	1910.	1911.	1912.		
	£	£	£	£	£
I. FOOD, DRINK, AND TOBACCO —					
A. Grain and flour	77,298,383	75,760,943	88,507,211	+12,746,268	+11,208,828
B. Meat, including animals for food	45,878,947	49,722,183	49,098,291	— 623,892	+ 219,344
C. Other food and drink—					
(1.) Non-dutiable	72,229,940	73,638,263	77,316,653	+ 3,678,390	+ 5,086,713
(2.) Dutiable	54,649,536	59,551,830	59,468,120	— 83,710	+ 4,818,584
D. Tobacco	4,624,782	5,284,918	6,373,851	+ 1,088,933	+ 1,749,069
Total, Class I.....	257,681,588	263,958,137	280,764,126	+16,805,989	+23,082,538
II. RAW MATERIALS AND ARTICLES					
MAINLY UNMANUFACTURED—					
A. Coal, coke, and manufac- tured fuel.....	34,119	29,779	276,516	+ 246,737	+ 242,397
B. Iron ore, scrap iron, and steel	6,261,471	5,799,162	6,219,068	+ 419,906	— 42,403
C. Other metallic ores	8,970,272	8,559,967	9,056,230	+ 496,263	+ 85,958
D. Wood and timber	26,207,329	25,862,171	28,351,315	+ 2,489,144	+ 2,143,986
E. Cotton	71,711,908	71,155,514	80,238,960	+ 9,083,446	+ 8,527,052
F. Wool	37,332,470	36,037,451	36,567,818	+ 530,367	— 764,652
G. Other textile materials	12,803,327	14,611,045	18,578,009	+ 3,967,054	+ 5,774,772
II. Oil seeds, nuts, oils, fats, and gums.....	37,548,960	35,047,549	37,444,580	+ 2,397,031	— 104,380
I. Hides and undressed skins	12,882,326	11,106,664	13,720,050	+ 2,613,386	+ 837,724
J. Paper making materials	4,972,487	4,749,521	5,567,199	+ 817,678	+ 594,712
K. Miscellaneous	42,450,959	34,900,038	39,693,698	+ 4,793,660	— 2,757,261
Total, Class II.....	261,175,628	248,158,861	275,743,533	+27,554,672	+14,537,995
III. ARTICLES WHOLLY OR MAINLY					
MANUFACTURED—					
A. Iron and steel and manufac- tures thereof	9,086,214	11,133,854	12,970,862	+ 1,837,008	+ 3,884,618
B. Other metals and manufac- tures thereof	24,699,194	27,581,244	31,199,898	+ 3,618,654	+ 6,500,704
C. Cutlery, hardware, imple- ments (except machine tools), and instruments ...	4,673,473	5,273,043	6,990,575	+ 1,717,532	+ 2,317,102
D. Electrical goods and apparat- us (other than machinery and telegraph and tele- phone wire).....	1,686,540	1,435,492	1,457,616	+ 22,154	— 228,894
E. Machinery	4,470,898	5,768,662	6,820,744	+ 1,052,082	+ 2,349,846
F. Ships (new)	27,104	64,184	33,654	— 30,530	+ 6,550
G. Manufactures of wood and timber (including furni- ture)	2,338,472	2,551,897	2,773,828	+ 321,931	+ 535,356
H. Yarns and textile fabrics—					
(1.) Cotton	10,874,628	11,279,717	11,511,533	+ 231,816	+ 636,905
(2.) Wool	9,599,286	9,586,856	10,112,360	+ 525,504	+ 513,074
(3.) Silk	13,521,021	13,441,249	14,356,279	+ 915,030	+ 835,258
(4.) Other materials	8,051,667	7,894,776	8,888,736	+ 993,960	+ 834,069
I. Apparel	5,107,315	5,199,932	6,041,393	+ 841,461	+ 934,078
J. Chemicals, drugs, dyes, and colours	11,259,685	11,411,060	12,561,561	+ 1,150,501	+ 1,301,876
K. Leather and manufactures thereof (including gloves, but excluding boots and shoes).....	11,824,741	12,227,521	14,343,347	+ 2,115,826	+ 2,518,606
L. Earthenware and glass	3,816,971	4,049,083	4,279,279	+ 230,196	+ 462,308
M. Paper	6,413,718	6,574,550	7,223,398	+ 658,848	+ 819,680
N. Railway carriages and trucks (not of iron), motor cars, cycles, carts, &c.	5,603,149	6,500,046	7,851,268	+ 1,351,322	+ 2,248,219
O. Miscellaneous	23,788,385	23,583,645	25,974,360	+ 2,390,715	+ 2,185,975
Total, Class III.....	156,845,461	165,557,111	185,500,821	+19,943,710	+28,655,360
IV. MISCELLANEOUS AND UNCLAS- SIFIED (including parcel post)	2,554,347	2,483,418	2,913,934	+ 434,616	+ 363,637
Total	678,257,024	680,157,527	744,896,514	+64,738,937	+66,639,490

* The values of the imports represent the cost, insurance, and freight; or, when goods are consigned for sale, the latest sale value of such goods.

*Values of Exports of British and Irish Produce and Manufactures for the Years 1910-11-12.**
[From the Monthly Trade Returns, December, 1912.]

	Year ended December 31,			Increase (+) or Decrease (-)	
	1910.	1911.	1912.	in 1912 as compared with 1911.	in 1912 as compared with 1910.
I. FOOD, DRINK, AND TOBACCO—					
A. Grain and flour	£ 3,416,637	£ 3,573,905	£ 4,240,633	+ 666,728	+ 823,996
B. Meat, including animals for food	935,958	1,023,361	1,101,196	+ 77,835	+ 165,238
C. Other food and drink	19,675,550	22,268,308	21,733,490	+ 2,461,572	+ 5,057,940
D. Tobacco	2,042,593	2,471,394	2,614,664	+ 443,270	+ 572,071
Total, Class I.	26,070,738	29,037,578	32,689,933	+ 3,652,405	+ 6,609,245
II. RAW MATERIALS AND ARTICLES MAINLY UNMANUFACTURED—					
A. Coal, coke, and manufactured fuel	37,813,360	38,147,354	42,581,774	+ 4,137,420	+ 4,771,414
B. Iron ore, scrap iron, and steel	476,863	452,614	409,384	- 43,230	- 67,479
C. Other metallic ores	71,791	110,965	115,956	+ 4,991	+ 44,165
D. Wood and timber	129,290	199,068	324,303	+ 125,235	+ 195,013
E. Cotton .....	...	...	...	...	...
F. Wool	4,220,413	3,901,752	4,818,226	+ 916,474	+ 597,783
G. Other textile materials	323,556	435,699	475,040	+ 39,341	+ 151,504
H. Oil seeds, nuts, oils, fats, and gums	5,023,499	4,793,768	4,570,067	- 223,701	- 453,433
I. Hides and undressed skins	1,757,762	1,685,293	2,028,311	+ 343,018	+ 270,549
J. Paper making materials	744,278	818,580	928,519	+ 109,939	+ 184,241
K. Miscellaneous	2,767,460	2,880,437	3,172,973	+ 292,536	+ 405,513
Total, Class II.	53,323,282	53,725,539	59,427,553	+ 5,702,023	+ 6,099,271
III. ARTICLES WHOLLY OR MAINLY MANUFACTURED—					
A. Iron and steel and manufactures thereof	42,976,671	43,730,292	48,628,918	+ 4,898,626	+ 5,652,247
B. Other metals and manufactures thereof	10,552,354	11,022,536	12,299,149	+ 1,276,613	+ 1,946,795
C. Cutlery, hardware, implements (except machine tools), and instruments	6,423,695	7,395,081	8,122,202	+ 727,118	+ 1,698,507
D. Electrical goods and apparatus (other than machinery, and telegraph and telephone wire)	4,102,602	2,819,371	4,369,877	+ 1,550,506	+ 267,275
E. Machinery	29,271,380	30,960,678	33,161,772	+ 2,201,094	+ 3,890,392
F. Ships (new)	8,770,204	5,663,115	7,031,899	+ 1,368,784	+ 1,738,305
G. Manufactures of wood and timber (including furniture)	1,835,762	2,037,272	2,058,981	+ 21,709	+ 228,219
H. Yarns and textile fabrics—					
(1.) Cotton	105,871,208	120,063,355	122,227,915	+ 2,164,560	+ 16,356,707
(2.) Wool	37,516,397	37,239,197	37,781,500	+ 542,303	+ 265,103
(3.) Silks	2,278,943	2,351,528	2,229,694	- 151,834	- 49,249
(4.) Other materials	13,481,198	13,198,754	14,575,241	+ 1,376,487	+ 1,094,043
I. Apparel	12,717,587	13,820,165	15,713,223	+ 1,892,758	+ 2,995,636
J. Chemicals, drugs, dyes, and colours	18,568,136	20,053,129	21,072,750	+ 1,019,621	+ 2,504,614
K. Leather and manufactures thereof (including gloves, but excluding boots and shoes)	4,686,485	4,879,175	5,252,091	+ 372,919	+ 565,609
L. Earthenware and glass	4,352,059	4,713,298	4,974,856	+ 261,558	+ 622,797
M. Paper	3,122,699	3,310,966	3,552,716	+ 241,750	+ 430,017
N. Railway carriages and trucks (not of iron), motor cars, cycles, cars, &c.	7,449,977	8,125,047	9,766,593	+ 1,641,546	+ 2,316,616
O. Miscellaneous	29,091,840	30,809,362	32,399,615	+ 1,590,253	+ 3,307,775
Total, Class III.	342,869,197	362,222,627	385,213,995	+ 22,996,368	+ 42,343,793
IV. MISCELLANEOUS AND UNCLASSIFIED (including parcel post) ..	8,116,555	9,133,563	10,097,471	+ 963,908	+ 1,980,916
Total	430,384,772	454,119,293	487,434,002	+ 33,314,704	+ 57,049,230

* The values of the exports represent the cost and the charges of delivering the goods on board the ship, and are known as the "free on board" values.

BANK OF ENGLAND.

Pursuant to the Act 7th and 8th Victoria, cap. 32 (1844),

[0,000's omitted.]

1	2	3	4	5	6	7
ISSUE DEPARTMENT.					COLLATERAL COLUMNS.	
Liabilities.	DATES. (Wednesdays)	Assets.			Notes in Hands of Public. (Col. 1 minus col. 16.)	Minimum Rates of Discount at Bank of England.
Notes Issued.		Government Debt.	Other Securities.	Gold Coin and Bullion.		
£ Mlms.	1912.	£ Mlms.	£ Mlms.	£ Mlms.	£ Mlms.	Per cent.
52.08	Jan. 3	11.02	7.43	33.63	29.19	
53.67	" 10	11.02	7.43	35.22	28.59	
54.90	" 17	11.02	7.43	36.45	28.04	
55.47	" 24	11.02	7.43	37.02	27.81	
55.83	" 31	11.02	7.43	37.38	28.26	
56.14	Feb. 7	11.02	7.43	37.69	27.94	
56.58	" 14	11.02	7.43	38.13	27.71	
57.09	" 21	11.02	7.43	38.64	27.68	
57.18	" 28	11.02	7.43	38.73	27.99	
56.09	Mar. 6	11.02	7.43	37.64	28.25	
55.02	" 13	11.02	7.43	36.57	28.12	3½
55.31	" 20	11.02	7.43	36.86	28.05	
55.16	" 27	11.02	7.43	36.71	28.49	
53.00	April 3	11.02	7.43	34.55	29.56	
53.48	" 10	11.02	7.43	35.03	28.04	
54.88	" 17	11.02	7.43	36.43	28.63	
56.56	" 24	11.02	7.43	38.11	28.64	
56.72	May 1	11.02	7.43	38.27	29.06	
56.69	" 8	11.02	7.43	39.69	28.93	3
56.74	" 15	11.02	7.43	38.29	28.78	
56.97	" 22	11.02	7.43	38.52	28.88	
56.33	" 29	11.02	7.43	37.88	28.95	
57.68	June 5	11.02	7.43	39.23	29.08	
58.06	" 12	11.02	7.43	39.61	28.79	
58.49	" 19	11.02	7.43	40.04	28.58	
58.10	" 26	11.02	7.43	39.65	29.21	
57.37	July 3	11.02	7.43	38.92	29.97	
57.37	" 10	11.02	7.43	38.92	29.57	
57.97	" 17	11.02	7.43	39.52	29.34	
58.21	" 24	11.02	7.43	39.76	29.33	
57.82	" 31	11.02	7.43	39.37	30.08	
56.79	Aug. 7	11.02	7.43	38.34	29.99	
58.01	" 14	11.02	7.43	39.56	29.51	
57.98	" 21	11.02	7.43	39.53	29.25	
58.85	" 28	11.02	7.43	40.10	29.19	4
59.39	Sept. 4	11.02	7.43	40.91	29.27	
59.29	" 11	11.02	7.43	40.84	28.86	
58.71	" 18	11.02	7.43	40.26	28.55	
58.71	" 25	11.02	7.43	40.26	28.83	
55.89	Oct. 2	11.02	7.43	37.44	29.59	
54.87	" 9	11.02	7.43	36.42	29.17	
54.56	" 16	11.02	7.43	36.11	28.63	5
54.44	" 23	11.02	7.43	35.99	28.54	
54.35	" 30	11.02	7.43	35.90	28.59	
53.62	Nov. 6	11.02	7.43	35.17	28.64	
53.74	" 13	11.02	7.43	35.29	28.30	
54.60	" 20	11.02	7.43	36.15	28.28	
54.96	" 27	11.02	7.43	36.51	28.31	
53.75	Dec. 4	11.02	7.43	35.30	28.60	
51.51	" 11	11.02	7.43	33.06	28.37	
49.86	" 18	11.02	7.43	31.41	28.77	
47.74	" 25	11.02	7.43	29.29	29.27	

—WEEKLY RETURN.

for Wednesday in each Week, during the Year 1912.

[0,000's omitted.]

8	9	10	11	12	13	14	15	16	17	18	
BANKING DEPARTMENT.											
Liabilities.					DATES. (Wednes- days.)	Assets.					Totals of Liabilities and Assets.
Capital and Rest.		Deposits.		Seven Day and other Bills.		Securities.		Reserve.			
Capital.	Rest.	Public.	Private.			Government.	Other.	Notes.	Gold and Silver Com.		
£	£	£	£	£	1912.	£	£	£	£	£	
Mlms.	Mlms.	Mlms.	Mlms.	Mlms.		Mlms.	Mlms.	Mlms.	Mlms.	Mlms.	
14,55	3,25	16,68	49,35	,2	Jan. 3	15,27	44,90	22,90	,79	83,85	
14,55	3,44	14,89	40,24	,3	" 10	15,27	31,97	25,09	,82	73,15	
14,55	3,47	16,98	39,61	,4	" 17	15,27	31,67	26,86	,86	74,65	
14,55	3,47	19,66	39,21	,5	" 24	15,27	27,66	27,66	1,02	77,93	
14,55	3,44	17,98	41,41	,2	" 31	15,27	33,62	27,58	,95	77,41	
14,55	3,51	18,22	37,30	,1	Feb. 7	14,87	29,33	28,20	1,20	73,60	
14,55	3,52	18,79	39,68	,3	" 14	15,15	31,45	28,88	1,10	76,57	
14,55	3,56	22,73	40,28	,4	" 21	15,15	35,34	29,41	1,26	81,17	
14,55	3,54	21,57	44,53	,1	" 28	15,12	38,86	29,19	1,34	84,51	
14,55	3,68	23,67	42,46	,1	Mar. 6	15,12	39,98	27,84	1,44	84,37	
14,55	3,72	23,77	43,59	,2	" 13	14,28	43,06	26,90	1,41	85,65	
14,55	3,74	25,00	41,61	,3	" 20	14,28	41,90	27,26	1,48	84,92	
14,55	3,81	25,86	39,37	,3	" 27	14,28	41,10	26,67	1,56	83,61	
14,55	3,79	22,16	40,50	,2	April 3	14,28	41,86	23,44	1,45	81,03	
14,55	3,20	20,04	40,38	,2	" 10	14,28	38,01	24,54	1,36	78,19	
14,55	3,22	19,00	41,87	,2	" 17	14,28	39,75	26,25	1,39	78,67	
14,55	3,23	18,60	41,89	,3	" 24	14,16	34,83	27,92	1,38	78,29	
14,55	3,23	18,05	41,34	,3	May 1	14,16	33,98	27,66	1,40	77,19	
14,55	3,23	17,30	39,75	,3	" 8	14,16	31,50	27,76	1,45	74,86	
14,55	3,24	16,77	39,59	,4	" 15	14,16	30,53	27,96	1,54	74,19	
14,55	3,25	20,45	37,19	,3	" 22	14,16	31,72	28,09	1,52	75,48	
14,55	3,24	20,49	41,21	,1	" 29	14,16	36,49	27,38	1,48	79,50	
14,55	3,25	21,71	40,31	,1	June 5	14,16	35,63	28,60	1,45	79,84	
14,55	3,25	22,23	39,79	,2	" 12	14,16	34,93	29,28	1,48	79,84	
14,55	3,26	23,38	40,53	,2	" 19	13,98	36,38	29,91	1,47	81,75	
14,55	3,27	23,72	43,02	,2	" 26	13,98	40,28	28,89	1,43	84,58	
14,55	3,35	21,38	48,39	,2	July 3	13,98	44,83	27,40	1,48	87,69	
14,55	3,43	17,89	40,36	,3	" 10	13,98	33,00	27,80	1,47	76,26	
14,55	3,45	17,58	41,38	,3	" 17	13,98	32,94	28,63	1,44	76,99	
14,55	3,47	18,37	41,72	,2	" 24	13,98	33,88	28,87	1,41	78,14	
14,55	3,48	17,97	41,80	,2	" 31	13,98	34,76	27,73	1,36	77,83	
14,55	3,52	16,82	40,85	,1	Aug. 7	13,98	33,61	26,80	1,35	75,75	
14,55	3,54	16,55	43,26	,3	" 14	13,98	34,14	28,50	1,32	77,94	
14,55	3,57	17,54	42,89	,2	" 21	13,37	35,10	28,73	1,38	78,58	
14,55	3,52	17,23	45,42	,1	" 28	13,37	36,37	29,66	1,34	80,73	
14,55	3,67	15,90	47,12	,2	Sept. 4	13,37	36,52	30,11	1,25	84,25	
14,55	3,67	15,51	47,36	,2	" 11	13,37	36,09	30,33	1,33	81,12	
14,55	3,68	15,88	46,36	,3	" 18	13,37	35,60	30,16	1,38	80,50	
14,55	3,77	16,87	44,04	,2	" 25	13,37	34,57	29,89	1,43	79,25	
14,55	3,75	13,95	43,08	,2	Oct. 2	13,34	34,20	26,30	1,50	75,34	
14,55	3,16	10,36	45,30	,2	" 9	13,34	32,86	25,70	1,50	73,30	
14,55	3,18	9,36	46,80	,4	" 16	13,04	33,51	25,93	1,45	73,93	
14,55	3,19	11,36	44,13	,3	" 23	13,04	32,73	25,91	1,59	73,27	
14,55	3,20	11,75	45,25	,2	" 30	13,04	34,53	25,76	1,43	74,77	
14,55	3,21	10,20	45,30	,4	Nov. 6	13,04	33,91	24,98	1,38	73,31	
14,55	3,22	12,76	40,81	,3	" 13	13,03	31,57	25,14	1,34	71,38	
14,55	3,24	13,88	40,64	,3	" 20	13,03	31,67	26,32	1,32	72,34	
14,55	3,21	13,18	41,75	,2	" 27	13,03	31,76	26,65	1,27	72,72	
14,55	3,19	11,88	40,54	,2	Dec. 4	13,03	30,88	25,15	1,12	70,18	
14,55	3,20	11,22	39,34	,4	" 11	13,03	30,99	25,13	1,19	68,34	
14,55	3,23	11,30	40,24	,3	" 18	13,03	34,16	21,10	1,07	69,36	
14,55	3,24	12,44	39,06	,4	" 25	13,03	36,78	18,47	1,03	69,32	

REVENUE OF THE UNITED KINGDOM.

*Net Produce in Quarters in 1912, and in Financial Years ended
March 31, 1911-12, 1910-11, 1909-10, 1908-09.*

[000's omitted.]

QUARTERS, ended	March 31, 1912.	June 30, 1912.	September 30, 1912.	December 31, 1912.	Total for Calendar Year 1912.
	£	£	£	£	£
Customs	8,493,	7,472,	8,164,	9,391,	33,520,
Excise	9,260,	8,040,	8,568,	11,739,	37,607,
Stamps and estate, &c., duties	9,882,	10,628,	8,206,	8,341,	37,057,
Taxes (Land Tax and House Duty)	2,200,	340,	30,	90,	2,660,
Post Office	6,325,	3,700,	4,820,	5,570,	20,415,
Telephone Service	1,440,	1,400,	1,600,	1,200,	5,640,
Telegraph Service	615,	750,	850,	760,	2,975,
Property and In- come Tax	38,215,	32,330,	32,238,	37,091,	139,874,
	31,383,	5,398,	3,174,	3,620,	43,575,
Crown Lands	69,598,	37,728,	35,412,	40,711,	183,449,
	160,	110,	100,	160,	530,
Interest on Advances	493,	5,	826,	13,	1,337,
Miscellaneous	591,	864,	440,	856,	2,751,
Land value duties	331,	40,	20,	33,	424,
<i>Totals</i>	<i>71,173,</i>	<i>38,747,</i>	<i>36,798,</i>	<i>41,773,</i>	<i>188,491,</i>

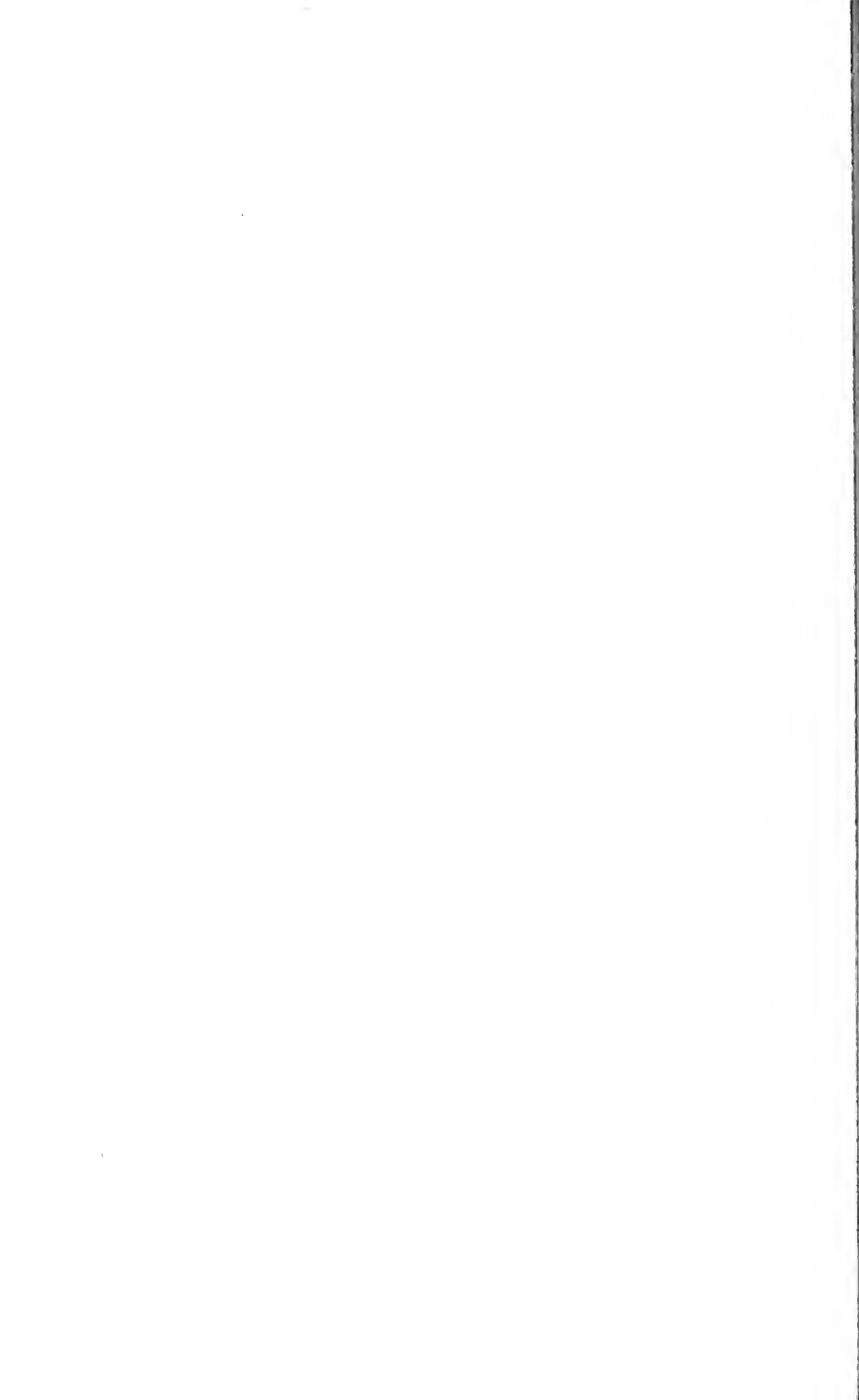
YEARS, ended March 31,	1911-12.	1910-11.	1911-12.		Corresponding Years.	
			Less.	More.	1909-10.	1908-09.
	£	£	£	£	£	£
Customs	33,649,	33,140,	—	509,	30,348,	29,200,
Excise	38,389,	40,020,	1,640,	—	31,032,	33,650,
Stamps and estate, &c., duties	34,846,	35,236,	390,	—	29,845,	26,140,
Taxes (Land Tax and House Duty)	2,880,	4,300,	1,420,	—	710,	2,630,
Post Office	19,650,	19,220,	—	430,	18,220,	17,770,
Telephone Service	2,945,	1,955,	—	990,	1,720,	1,510,
Telegraph Service	3,105,	3,175,	70,	—	3,090,	3,020,
Property and In- come Tax	135,455,	137,046,	3,520,	1,929,	114,965,	113,920,
	44,804,	61,946,	17,142,	—	13,295,	33,930,
Crown Lands	180,259,	198,992,	20,662,	1,929,	128,260,	147,850,
	530,	500,	—	30,	480,	530,
Interest on Advances	1,281,	1,234,	—	47,	1,296,	1,171,
Miscellaneous	2,539,	2,604,	65,	—	1,687,	2,027,
<i>Totals</i>	<i>*184,609,</i>	<i>*203,330,</i>	<i>20,727,</i>	<i>2,006,</i>	<i>131,696,</i>	<i>151,578,</i>
			NET DECR. £18,721.			

* Excluding Land Value Duties.

GOLD AND SILVER BULLION AND SPECIE.—(United Kingdom.)
—Declared Real Value of, IMPORTED AND EXPORTED, for the Years
1912-11-10.

[000's omitted.]

Countries.	1912.		1911.		1910.	
	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.
Imported from—	£	£	£	£	£	£
Australasia	975,	58,	1,535,	48,	2,318,	61,
S. America, Brazil, } Mexico, W. Indies }	1,376,	430,	2,327,	341,	1,921,	166,
United States	17,	13,361,	66,	11,898,	6,673,	11,333,
	2,368,	13,849,	3,928,	12,287,	10,912,	11,560,
France	118,	221,	1,830,	177,	4,361,	138,
Germany, Holland, } and Belgium }	544,	785,	240,	349,	958,	124,
Portugal, Spain, } and Gibraltar }	123,	28,	103,	14,	100,	31,
Malta and Egypt.....	78,	38,	747,	32,	1,793,	63,
China, with Hong } Kong and Japan }	—	482,	—	30,	—	84,
West Coast of Africa	1,520,	29,	943,	153,	722,	9,
British Possessions } in South Africa }	41,213,	7,	37,217,	3,	34,081,	20,
British East Indies	172,	6,	139,	27,	2,220,	—
All other Countries ...	6,553,	1,333,	3,547,	1,222,	2,175,	2,071,
<i>Totals Imported ...</i>	52,689,	16,778,	48,694,	14,294,	57,322,	14,100,
Exported to—						
France	1,661,	362,	6,571,	942,	4,275,	538,
Germany, Holland, } Belg., and Sweden }	8,526,	994,	7,047,	1,791,	10,958,	1,382,
Russia	480,	976,	481,	1,733,	1,558,	1,110,
Portugal, Spain, } and Gibraltar }	170,	164,	165,	130,	159,	64,
Malta and Egypt.....	8,391,	102,	4,195,	247,	10,800,	82,
	19,228,	2,598,	18,459,	4,843,	27,750,	3,176,
B. India, China, } Hong Kong, and } Japan	13,100,	14,300,	9,165,	9,831,	10,294,	8,609,
United States	2,051,	24,	14,	9,	2,742,	—
South Africa	73,	86,	337,	160,	1,490,	186,
S. America, Mexico, } W. Indies	6,438,	475,	6,431,	441,	2,928,	165,
All other Countries ...	5,648,	850,	5,694,	1,639,	5,694,	1,335,
<i>Totals Exported ...</i>	46,538,	18,333,	40,100,	16,923,	50,898,	13,471,
Excess of imports ...	6,151,	—	8,594,	—	6,424,	629,
„ exports ...	—	1,555,	—	2,630,	—	—



JOURNAL
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The Population of England in the Eighteenth Century.

By PROFESSOR EDWARD C. K. GONNER, M.A.

[Read before the Royal Statistical Society, January 21, 1913,
the President, Professor F. Y. EDGEWORTH, M.A., F.B.A., in the Chair.]

THE unfortunate superstition which delayed the taking of a census of the population of Great Britain for some half century or more has entailed a burden of ignorance on future generations which all efforts are ineffectual to remove in its entirety. It did not check pride and vanity, it did not damp curiosity, though it made the one vague and deprived the other of certain methods of verifying its conjectures. Thus it is that the many inquiries on this subject made in the eighteenth century have achieved results which fall far short of accuracy. The best of them is but an approximation, while the worst bears no relation whatever to the truth. Nor is this surprising when the material at the command of eighteenth century statisticians is taken into account. No doubt, too, the side from which the question was approached had something to do with the great difference between the estimates of different and antagonistic writers. Then, as now, there were pessimists and optimists, those who thought their country were going to rack and ruin, and those who believed in its progress; and estimates which were to serve as the seal to the expression of these opposing views were the subject of controversial rather than of scientific inquiry. From such blame the few writers who ventured into statistics of population at the close of the seventeenth century and the opening of the eighteenth are fairly free. They handed in their accounts, if not without basing conclusions on them, still without forming them with a view to their serving as a basis for such. The material which they used were the returns to the Hearth Tax. Deduced from these there are two estimates respectively for 1690 and 1691. That for the former year, which is given in Gregory King's *Political observations*

upon the state and condition of England (Harl. MS. 1898), stated the number of houses in England and Wales at 1,319,315, and was adopted by Davenant. From his reputation it gained an added authority. The second, published by John Houghton, the author of *Collections on Trade and Husbandry*, and attributed to the same source for 1691 places the number at 1,175,951, and seems equally deserving of credit as well as equally open to criticism. Houghton's table gives the number of people to the separate counties, a feature likewise to be found in Chalmer's reprint of King's figures. But in both instances the returns appear open to the charge that they give the number not of houses but of families. This which appears probably from a comparison with the number of separate hearths quoted by Davenant, according to which there would be an average of less than two hearths to each house, is placed beyond doubt so far as Gregory King's numbers are concerned, by his own words "whereas the chimney money being charged on the Tenant or Inhabitant the divided houses stand as so many distinct dwellings in the account of the said Hearth office and whereas the empty houses, smith's shops, &c., are included in the said account, all which may very well amount to 1 in 36 or 37 (or near 3 per cent.) which in the whole may be about 36,000." No doubt the same defect applies to Houghton's figures. As far as can be judged there is no ground for attaching any importance to King's conjecture as to the actual degree of error arising from the confusion of houses and families. According to the census of 1801 the difference, as far as this item alone is concerned, exceeds 13 per cent. in place of the 3 per cent. thus allowed, and though the habits of the people altered in some measure during the century it would be impossible to reduce the error to so small an amount without some very strong reasons. Howlett in 1781 gave a table of certain parishes which conclusively proves the existence of a large disparity between the numbers of families and houses.

The foregoing calculations represent the state of knowledge as to the population in the country when the effects of war and the changes beginning in the rural districts coupled with the greater absorption of the people in towns quickened alteration and led to two heated controversies.

The first and less well-known of these, between Dr. Brackenridge and the Rev. Richard Forster, has escaped notice largely because of the place where it once attained prominence, the *Proceedings of the Royal Society*. Dr. Brackenridge, who took a moderately gloomy view of the position of the country when compared with his successors in the cause of pessimism, began the controversy with three communications. The first of these (1754, *Phil. Trans.*, vol. 48)

was of comparatively slight importance, and dealt with the probable decrease of the population of London within the bills of mortality. The method was unsatisfactory as it based the probability of diminution on the smaller number of burials within recent years. In the second and third we come to the more serious issue as to what was the present rate of increase or decrease for the entire population of England and Wales. His comparison was between 1710 and the date at which he was writing. Beginning with an examination of the means in existence for forming any such estimate, an inquiry which issued in the discovery of two, first the number of houses, and secondly the quantity of bread consumed, he proceeded to give an enumeration of houses for either 1710 or a year preceding it. This number, drawn from the information collected for the Window and House Tax Office, he sets out at

Houses charged to taxes	729,048
Cottages added on hypothesis	182,262
	<hr/>
	911,310
	<hr/>

which number, assuming that there were 6 persons to the house throughout the country, as in London, a fact which he mentions in his first communication, leads to an estimate of the population for that date at 5,467,860. Since then there had not been a large increase, he adds, for he calculates from the rates of births and deaths that the population at the time of his paper had reached 6,257,418. His method of arriving at this figure was to calculate the rate of increase since 1710 from the average death-rate and the average birth-rate, neither of which, it may be remarked, was at all accurately known. This result, which he probably felt to be somewhat insecure, was, in his view, confirmed by a curious computation¹ as to the amount of bread used at home. These lumbering guesses as to the population of the time were, however, put on one side in a further communication (*Phil. Trans.*, vol. 49, 1755) in favour of a statement based on the returns for the window and house tax in 1750, according to which

The houses charged were in number	690,000
To these he adds for cottages	200,000
	<hr/>
	890,000
	<hr/>

¹ This computation, equally unscientific with that which it is adduced to support, is infinitely more fantastic. A somewhat arbitrary decision was made as to the amount consumed per person, while the total was discovered by assuming that wheat employed in home consumption would stand to the amount of barley used in malting in the proportion of 3 to 2, the quantity of barley malted being calculated from the malt tax returns.

a result which he considered accorded satisfactorily with his previous calculation, in apparent disregard of the fact that by one there was a trifling increase, by the other a small decrease. The accuracy of this depended very largely on the number of cottages added to the return. To use his own words "though the number of cottages be "not accurately known, it appears from the accounts given in that "they they cannot amount to above 200,000." The basis of this estimate for cottages and implicitly the correctness of Dr. Brackenridge's assertion as to his reasons for arriving at it did not escape the notice of Mr. Forster in his papers on the subject when he remarks that the number rests on pure hypothesis as there are not any returns on the subject, a criticism which Dr. Brackenridge does not refute in his subsequent reply. Passing from this point Forster proceeded to the consideration of the allowance which should be made. Taking nine country parishes he points out that out of 588 houses only 177 were charged to the tax, while in Lambourn market town 229 were assessed out of a total of 445. From these considerations he concluded that a much larger allowance must be made for houses which escaped the tax. To this he appends a conjecture of his own as to the possible number of the population, starting from the return of 690,000 taxed houses in 1750.

200,000 of these with cottages added in the proportion of the nine rural parishes	} = 664,406
200,000 more similarly treated as Lambourn market town rate	} = 388,646
The remaining 290,000 which were assumed to be urban with addition at a lower rate	} = 374,058
	<hr/>
	1,427,110

These numbers he multiplies for population, in the case of the country by 5 and in towns by 6, with a result as to population of 7,509,608,² a number which he supported by a calculation from the militia returns. This was his final calculation, for in the earlier of his two communications he proceeded on the assumption that at least half the houses in the country escaped taxation; and multiplying the total by 5 for people, he gave the houses at 1,458,096 and the population at 7,290,480. In both cases he states his results as approximations, but considers them sufficient to disprove the suggested diminution in numbers and to substantiate a probable increase. In a nettled reply Dr. Brackenridge attacked Forster's papers, directing attention to the insufficient number of parishes taken into account. Through intention or carelessness he neglects to consider their pertinence as criticisms of his own previous communications. To this Forster very naturally replied, but his answer

² It is not possible to place any dependence upon this estimate.

was rejected by the Royal Society. However, it fortunately survives so far as its substance is concerned in a letter to Dr. Birch.³ In it he emphasises the nature of his earlier communications as critical, points out that they were fully justified since even Dr. Brackenridge while abstaining from admitting their justice, appeared to have become doubtful as to his original estimate of 200,000 for cottages, and to have become inclined to reckon these latter at half the number of the rated houses, and concludes with the argument that other computations as to houses, and the militia returns of the West Riding of Yorkshire afforded sufficient ground for placing the number of the people at over seven million.

The second controversy was of much greater importance, not only by reason of the greater interest excited, but also through the greater merit of the publications it called forth and the ability displayed by some at least of the combatants. It centred round the opinions expressed by Dr. Richard Price, not because they were original nor because they were thorough or sound, but owing it would seem to the singular quality of notoriety which attaches to the publications of certain writers. In this instance Dr. Price attained to a reputation at the time which, to those looking back from the vantage ground of after generations, seems more rightfully due to those who refuted his conclusions. In simple point of fact, in the controversy which Dr. Price stirred into activity on this subject, the more important arguments adduced in support of his case were admittedly borrowed from other writers and only stated at greater length and with greater pertinacity. In the *Considerations on the Trade and Finances of the United Kingdom* (3rd edition, 1769), a pamphlet ascribed by Price to George Greville, but by others attributed to Thomas Whateley, the supposed diminution in population between 1759 and 1765, as shown by a decrease in the number of houses, both assessed and total, is dwelt on and deplored as one sign of the evil state of the then present time. The year 1765 was apparently a misprint for 1761, to which the number cited relates. It was, however, copied by Price, corrected by Howlett to 1761, without remark, and printed as 1761 by Price, *also without remark*, in the separate edition of the *Essay* (1780). Little, if any, notice was taken of the circumstance thus lugubriously introduced amid other details for dejection. Inattention was soon reprov'd. In the first edition of *Reversionary payments* (1771), Dr. Price, in a note to p. 183, made a reference to the significant position of the population, mainly based on Dr. Brackenridge's calculation, and without any reference to Forster's chastening criticism. In the second edition of the same work (1772), the matter was referred to

³ Birch, MSS. 4,440.

again, and coupled with a reference to the figures adduced in the *Considerations, &c.*; the whole matter receiving special treatment in a supplement to the same edition, printed both at the end of the work and also separately in the same year. On these remarks, Arthur Young passed some criticisms in *Political arithmetick*, p. 89 *et passim*, which were noticed slightly by Price in the third edition (1773) of *Reversionary payments*, mainly in notes on pp. 183 and 375. In the *Appeal to the public on the subject of the National Debt*, 2nd edition (1772), Dr. Price also alluded to certain aspects of the subject.⁴ Here the matter rested for a few years. Then, in 1779, Price repeated and attempted to substantiate his views in an *Essay on the present state of population in England and Wales*, published first as an appendix to Morgan's work on *Assurances*. There was no longer any appearance of indifference or neglect. In the third edition (1780) of his *Letters to the Earl of Carlisle*, William Eden included a fifth letter dealing with Price's estimates and the subject of the population. To some of these remarks Price replied in the new edition of his now noted essay, published separately, and bearing the title *An essay on the population of England and Wales from the Revolution to the Present Time* (1780). The next year saw the publication of the two most thoroughgoing criticisms of the matter by Howlett and Wales, and of a professedly impartial consideration entitled *Uncertainty of the present population of this Kingdom*, and published anonymously. In the fourth edition of *Reversionary payments* (1783), Price attempted a defence of his position, and replied to his critics with a considerable display of temper, at any rate so far as Howlett was concerned. In 1786, Howlett published a pamphlet in which, without reference to the general controversy, he dealt very fully and very drastically with the contention advanced by Price and others as to the ill-effect of the enclosure of commons and open fields on population.

Price, who had embraced a view distinctly more pessimistic than that expressed by Brackenridge, sought to establish his position,⁵ first by estimates formed from the number of houses assessed to the window and house tax, and secondly, by the massing of additional corroborative evidence, all of which went to show, he argued, both that the population of England and Wales had been vastly overestimated, and that it had been rapidly and seriously decreasing. The main basis of argument consists of a table giving the number of houses in England and Wales.⁶

⁴ Pp. 93, 394, &c.

⁵ The account of Price's views is put together from his various writings.

⁶ *Reversionary Payments*, third edition, pp. 374—376; *Essays* (1779), pp. 285—289. The numbers for 1710 and 1750 he cites from Brackenridge. Those for the later years are to be found in a Parliamentary return: Parliamentary Papers, general collection, vol. 60.

	Houses asse-sed.	Houses chargeable.	Cottages.	Total.
1660	—	—	—	1,230,000
'90	—	—	—	1,319,000
1710	729,048	—	—	—
'50	690,000	—	—	—
'59	679,149	24,904	282,429	986,482
'61 (1765)	678,915	25,628	276,119	980,692
'77	682,077	19,396	251,261	952,734

As an addition to this table which, *if reliable*, tells its own tale, he gives a comparison between the nature of the assessed houses in 1761 (1765) and 1777, showing that the decrease has taken place in the houses having fewer windows, those having a large number having positively increased in number. His conclusions follow readily enough. In the first place there had taken place an evident fall in population since 1690, amounting, he states, up to 1761 (1765) to something like one million and a-half.⁷ In the next place this decrease is rendered the more certain and deplorable as having taken place among those inhabiting the smaller houses. While, finally, he computes the population at something under 5,000,000. In the essay (1780, p. 14), he contends that the number of persons to the house is certainly under 5, probably $4\frac{1}{2}$, and allowing a slight addition for inaccuracies to the total return,⁸ as he does when hard pressed by his critics, the total number is still placed at under 5,000,000. It must be noticed that though he refuses to surrender his former conclusions, and apparently adheres to his earlier estimate, his confidence seems a little shaken, as he gives in 1783 various estimates as possible. His readers are offered a kindly choice in the number of houses between 1,013,000, 1,125,000, 1,159,000, and even 1,187,000, while Price gloomily selects those lower in the scale and finds a curious satisfaction in pointing out that the highest of all these four is lower than that for 1690.

His corroborative evidence comes next in display: it may be grouped under three headings—

1. Hereditary and Temporary Exeise.
2. Instances of decrease in population through enclosing.
3. Bills of Mortality for London.

Starting with the first he argues that the decrease in revenue between the average for the four years ending 1689, 740,147*l.*, and that for the three years ending with 1768, 527,991*l.*, points to a drop in the amount consumed and consequently in the number of

⁷ *Reversionary Payments*, third edition, p. 375.

⁸ *Reversionary Payments*, fourth edition (1783), ii, pp. 282—286.

consumers.⁹ Not only so but there was, he contends, evidence of a falling off in the amount brewed for sale and in the number of licensed victuallers.

The effect of the Enclosure Acts had greatly tended, he asserted, to depopulate the rural districts where land which had hitherto supported a laborious and considerable population had been turned into pasture. This contention, a by no means uncommon one at the time, is not very lengthily treated by Dr. Price who, in this instance, seems to have been aware that he was dealing with a matter which required more information than he possessed, and so contents himself with a few scattered instances and some rather vague generalities. The former he takes mostly from Addington, and they relate to Leicester and Northampton,¹⁰ but he adds a communication of a very unspecific character from a gentleman in Norfolk on the strength of which he asserts that a similar change is occurring in that county. Among his general observations he somewhat unhappily inserts one to the effect that the rise in the price of meat,¹¹ owing to enclosures, has depressed the condition and tended to reduce the number of the poorer classes.

From the London Bills of Mortality some confirmation, sufficient at any rate to satisfy Dr. Price, was derived as to the non-progressive character of the population. Though he does not say that the apparent decline in the population of London is conclusive as to a similar state of things in England and Wales, he urges that such a symptom in the metropolis is suggestive of the existence of the same in the whole country. Taking certain averages of the burials in the various parishes he argues that the fact itself is beyond question especially when it is remembered that there were twelve additional parishes included at the later dates and that there had been a decrease in the number of Dissenters. Despite this, he seems to have attached much less weight to this argument than to those elsewhere adduced, for though dwelt on at length in the Third Edition of *Reversionary Payments* (1773), it is omitted in the Essay published at the end of Morgan's *Assurances* (1779) and only reappears in an appendix when the same was published separately in the ensuing year. Moreover, in 1773, he admits that despite previous decline the population of London was again increasing, an opinion which is, however, wanting in his pamphlet in 1780. This admission, temporary though it was, affords a curious instance of the persistent

⁹ *Observations* (1779), p. 294; also *Reversionary Payments*, fourth edition, vol. ii, p. 323.

¹⁰ *Reversionary Payments*, third edition, pp. 380—390; *Appeal to the Public*, p. 93.

¹¹ *Reversionary Payments*, third edition, p. 383.

and dogged pessimism of the writer, who, after his admission, as if in fact to mark the reluctance with which it was made, proceeds, "But it appears that, in truth, this is an event more to be dreaded than desired. The more London increases, the more the rest of the country must be deserted."¹²

These contributions merit notice by reason of the answers and criticisms called forth which furnish a large amount of information as to the real circumstances of the times. This is contained partly in the destructive criticism which was levelled against Price's arguments and data but more fully and in a more satisfactory form in the attempt made to construct a positive case in reply or as an alternative to that which he had offered to the public. The former is, however, an interesting and valuable proof of the care, insight, and attention applied to the question by William Eden, Howlett and Wales.

Approaching the main argument several considerations are offered with regard to the estimate of houses cited from Davenant, but really formed by Gregory King. Though the suggestion¹³ that this was mainly of the nature of a conjecture seems quite untenable, there are a number of important critical points raised. The confusion between families and houses was noticed and substantiated both from Davenant's loose use¹⁴ of the two terms as equivalent and from the fact that by this calculation as compared with the actual statement of the number of hearths (hearths = 2,563,527; houses = 1,319,215) there would be an average of less than two hearths to a house.¹⁵ Further, an account of houses, wrongly attributed to Dr. Halley but really published by Houghton, giving the number of houses in 1691 as 1,175,951, is added.¹⁶ Price's attempted rejoinder was inadequate in every way, consisting as it does of general remarks as to the unlikelihood of such confusion on the part of Davenant and the argument that even if made it did not matter as the number of persons to a family and a house were very much the same, in support of which he refers to a table previously given.¹⁷ That the number

¹² *Reversionary Payments*, third edition, p. 205.

¹³ Eden, *Letters*, &c., appendix xxii.

¹⁴ Eden, *Letters*, &c., appendix xxxiii. Howlett, *Exam.*, p. 45.

¹⁵ Eden, *Letters*, &c., appendix xxii. Howlett, *Exam.*, p. 46.

¹⁶ Eden, *Letters*, &c., appendix xxi. A. Young, *Political Arithmetic*, p. 324.

Dr. Price's reply that these figures are not given by Dr. Halley as Eden supposed, is immaterial. Eden was misled by reading them in an account of the population given by Houghton, who states his indebtedness to Halley for some of the calculations. The return is given in great detail, and obviously taken with great care from the figures of the Hearth Office. The difference between it and that taken by King from the figures for the previous year seems to show the uncertainty of this tax.

¹⁷ See *Reversionary Payments*, second edition, appendix, p. 42.

cited is of householders in the family sense and not houses may now be taken as certain (v. *supra*) ; while the latter supposition had been vigorously rebutted by Howlett, who, after the remark that the table referred to showed nothing of the kind, had substantiated¹⁸ his own assertion partly from Price's own figures and partly from direct evidence collected by himself. This partially anticipatory disproof Price failed to notice.

The stream of criticism was next directed to the recent accounts of houses derived from the returns to the window and house taxes, with regard to the general accuracy of which both Howlett and Wales¹⁹ felt some doubt. They felt no doubt at all as to the inaccuracy of the estimates formed of the number of cottages and houses exempted from taxation. In support of their view that the figures relating to these are worthless, a large amount of direct and indirect evidence was adduced, ranging from the testimony of common notoriety²⁰ to specific instances of omission.²¹ Even more conclusive than these are the cases given both by Howlett and Wales²² of deficiencies in returns, which were put together by the former in one table for the purpose of determining the proportion which the charged houses bore to the totals. Fight though Price did against conviction, he ultimately yielded the point so far as Wales was concerned, and even adds a list—a short list be it noticed—of instances where, as in the foregoing, the houses have been independently enumerated and the totals compared with those

¹⁸ Howlett, pp. 47—50.

¹⁹ Wales, *Inquiry*.

²⁰ Eden, *Letters*, §c., appendix xxix: "It is notorious and avowed that the 'surveyors' returns are conjectural and very defective" in this respect. Howlett, p. 57. A. Young, *Political Arithmetic*, p. 89: "The last public lists 'of 1759 and 1766 are known by experiment to be false. Catalogues were 'taken in a variety of parishes about Wentworth House, in Yorkshire, by order 'of the Marquis of Rockingham; and similar trials were made elsewhere, in 'all of which the number exceeded the reports of the surveyors, who in most 'parts of England paid little attention to houses exempt from the tax." See also *Political Arithmetic*, p. 326.

²¹ Wales gives instances where it was found on inquiry that no return was made of uncharged houses in 1777. Howlett, p. 61, cites a letter from a general surveyor, who states that "the cottages have not been returned for many years 'till last year, and then many of the assessors did not do so till they came to 'the meeting, and then guessed at it as near as they could." Price's retort (*Reversionary Payments*, fourth edition, p. 283), that Howlett made a monstrous blunder in saying there was no return in 1777, is no answer to Howlett's line of argument—that, whatever conjectures there were, there was no trustworthy or real return.

²² Howlett, *Exam.*, pp. 59—60, gives two tables—one of actual deficiencies and another of a few places where the returns had fallen off, though actual enumeration demonstrated an increase in the population.

charged. With regard to Howlett, who seems to have roused his ire by the caustic severity of remarks, he is not so compliant. His figures are criticised and pronounced inaccurate²³ because the charged houses in the larger parishes he mentions do not correspond in number with those in the return of 1777. Howlett, however, does not say that the figures were for 1777. As an actual matter of fact in those cases, that is of parishes having over 400 assessed houses, where comparison between Howlett's figures and the return of 1777, both relating to charged houses, is possible there is almost always some slight difference, due no doubt to small differences in the houses uninhabited, but the total in 1777 points to the existence of a still greater error than did that of the time when Howlett obtained his figures. Be that as it may, Price admits some uncertainty and states that certain additions have probably to be made. As to uninhabited houses which, but for this circumstance, would be rightly charged, Howlett points out²⁴ that their inclusion in a total from which the population is to be calculated is incorrect, to which is added the pertinent observation that if the nation is becoming poorer and the number of houses charged decreasing it would be natural that the number of those exempt for poverty should increase and not decrease.²⁵ There were two other points which escaped notice at the time. The change in the nature of houses assessed which took the direction of an absolute as well as a comparative increase in the larger, those having eight windows and upward, would in all probability have some effect on the number of those inhabiting them. Moreover, this increase, in addition to such a consequence, when unaccompanied by a corresponding, or at any rate, nearly corresponding increase in those slightly smaller, really suggests the probability that with the progress of years new means of evading the window and house tax were discovered. Such evasion, which necessarily casts a doubt on the value of the numbers of even the assessed house as a means of comparison between different years was noticed and treated as of great importance by Sir F. M. Eden,²⁶ who refers to the matter as almost certain, and in comparing two estimates for 1750 and 1759, says that the larger number of those charged in the earlier year was owing to the recent new act which people could not immediately evade by stopping up windows and other measures.

²³ Price, *Reversionary Payments*, fourth edition, pp. 286—288. Even this criticism is not original; it follows that made by the anonymous author of the *Uncertainty*.

²⁴ Howlett, *Exam.*, pp. 52—53.

²⁵ Howlett, *Exam.*, p. 53.

²⁶ *An estimate of the number of inhabitants*, &c., 1800, p. 23, &c.

In connection with the number of houses arose the question as to the relation which these bore to the population. Though at one time Price chose to estimate²⁷ the number of persons to a house at about $4\frac{1}{2}$, and though in no place does he frankly admit his error, later calculations inclined him to the view that 5 might be allowed. This concession is, it is true, only made in a most guarded way, but that it was incumbent on him is made clear by the tables he himself furnished. In his earlier accounts he fell into grievous error²⁸ by excluding from his reckonings not only London, where the rate was admittedly high, but institutions, colleges and poor-houses. A correct reading of the table²⁹ given by him in 1780 placed the number at $5\frac{1}{6}$. From this table London remains excluded. The whole matter was dealt with by Howlett, and both his numbers and those of Price and others are carefully considered by Sir F. M. Eden³⁰ in a pamphlet published at a much later date.

Not content with the demolition of the main basis on which Price had rested his conclusions as to decay, his critics turned to his subsidiary arguments.

With regard to the first of these, that, namely, drawn from sundry statements with regard to the excise revenue, Eden³¹ is convincing. He notices as a matter of actual knowledge that there have been sundry deductions made since 1736 from this yield under this heading, but dismisses them as of *comparatively* small account. He could afford to do so in the light of what followed. Side by side with the annual average of the four years ending 1689 of 740,147*l.* he places the annual average for the three-year periods ending respectively with 1695 and 1698, and amounting in the first case to 484,183*l.*, in the second to 464,142*l.*, an annual average falling far below that of late years. In this way he points out the danger of taking averages for short periods, a lesson which, after enunciating very clearly, he proceeds to enforce by showing that if the singularly short periods given by Price was a little differently chosen they would tend to show that the quantity of beer brewed had increased as also the number of victuallers. But Price³² was adamant against

²⁷ *Reversionary Payments*, third edition, p. 185, note.

²⁸ This was very forcibly pointed out by Young, *Political Arithmetic*, pp. 326—328.

²⁹ Of the 38 places for which he offers enumerated accounts, 14 have to be excluded as relating to families, not houses; while, of those remaining, 2 more refer to foreign towns, and 1 of Bala is twice inserted. *Essay*, published separately. This table is nearly identical with that in *Reversionary Payments*, fourth edition, ii, p. 288.

³⁰ *An Estimate of the number of inhabitants in Great Britain and Ireland*, by Sir F. M. Eden, 1800.

³¹ Eden, *Letters*, &c., appendix xxxi—xxxiii.

³² *Essay*, printed separately, pp. 49, 51, &c.

such arguments. He upheld his position, denounced long averages and attempted to account for the fall between the average of the three years ending with 1689 and the others cited by Eden by vague and futile references to alterations in the value of money. At the same time he gave a table³³ which he considered convincing; whom it was to convince he does not say. It should have convinced him; it only corroborated Eden. In face of this pertinacity the caustic severity of Howlett's attack³⁴ will be read without surprise. Long averages are adopted and shown to demonstrate the reality of the increase, while even a fall, had such been the case, might, it is suggested, have arisen from the growth of smuggling spirits and tea. Similarly a decrease in the number of licensed victuallers might well have accompanied the increase in the unlicensed sale of brandy, which Howlett apparently considers to be incontrovertible. But decreases or increases in the article consumed are by themselves, it is sarcastically added, no certain evidence of an alteration in population; the "increased consumption of wheat and corn is no evidence of a proportional increase of men and women."³⁵

In dealing with the effect of enclosure the incautious remarks which Price had let fall as to the rise in price of meat with the corresponding injury to the poor laid him open to the obvious retort, that the arguments he advanced were irreconcilable, that in one breath he complained of the conversion of arable into pasture and in the next of want due to the insufficient supply of cattle and sheep. Nor did the nature of the testimony cited by him, consisting as it did of a few chance instances, escape the notice of men like Young³⁶ and Howlett³⁷, who had actual knowledge of rural conditions and had collected large masses of evidence which pointed to the opposite

³³ Annual average :—

	£		£
Three years ending 1689 ...	700,147	Two years ending 1746 ...	495,749
Two " " '95....	438,573	" " " '53 ...	527,091
" " " '99....	381,886	" " " '61....	575,280
" " " 1703....	473,799	Four " " '68....	527,991
" " " '10 ...	449,666	" " " '74....	520,613
" " " '19....	509,370	" " " '78....	554,460
" " " '36....	515,400		

³⁴ Howlett, *Exam.*, p. 75, &c.

³⁵ Howlett, *Exam.*, p. 75.

³⁶ *Political Arithmetic*, pp. 132, 148, &c. On p. 132 he says, of enclosures, it is argued in effect that "they make beef and mutton dear by infinitely increasing the number of fat sheep and oxen." *Six Months Tour*, vol. iv, pp. 192, 251—253, &c.

³⁷ Howlett, *Exam.*, pp. 33—34, where he cites Young. In his pamphlet of 1786 on this subject he gives lists which show that, for the country at large, Price's conclusions did not hold good.

conclusion, so far as the whole country was concerned, or even of Wales,³⁸ who, with equal definiteness, denies the correctness of Price's conclusions.

On turning to the third of the grounds by which the main thesis was given some supposed support, the most bitter critic, Howlett, observed that to the evidence afforded by the bills of mortality for London, it was necessary to add that derived from the changes taking place in the county surrounding the city. In this relation the increase³⁹ in the inhabitants of the villages immediately touching the Metropolis, as shown by their bills of mortality, becomes an element, the omission of which invalidates the entire result. In view also of the reflection introduced by Price as to the melancholy consequences of an increase of the capital as seen in the desertion of the rural districts he is unable to restrain the gibe that "if the doctor's maxim of the destructive influence of great capitals "be true," the assertion as to its decrease "might afford, perhaps, "no inconsiderable presumption that England was actually advancing in numbers; that the inhabitants were retiring into the "country."⁴⁰ Further, taking the arguments in themselves which Price had employed, certain grave defects are pointed out. The assertion, for it was nothing more, as to the decrease in the number of Dissenters, was shown to be open to serious doubt; indeed, the returns⁴¹ of their burial grounds as furnished by Howlett seem to do more than this, and actually to prove an increase. Again, the twelve additional parishes, on which so much stress was laid, were additions in name only, being the result of the separation into two of old parishes,⁴² while in answer to the initial argument that a falling off in the burial returns is ground for a like supposition with regard to the numbers of the total population it was urged that the evidence of burial returns by themselves is hardly conclusive, and that though the returns of baptisms are preferable, far more reliable results are reached by calculations which combine the two. Forming such, and applying them to fair averages of years, Wales showed that there was every ground for accrediting London with a fairly steady increase.⁴³

To establish another estimate of the population of England and Wales, which both Howlett and Wales desired, was a much more difficult task than the demolition of the case subjected to their

³⁸ Wales, pp. 73.

³⁹ Howlett, *Exam.*, pp. 76—77, where tables of their growth are exhibited.

⁴⁰ Howlett, *Exam.*, p. 64.

⁴¹ Howlett, *Exam.*, pp. 68—70.

⁴² Wales, pp. 25—27; Howlett, *Exam.*, pp. 65—66.

⁴³ Wales, pp. 24—25; Howlett, *Exam.*, pp. 83—84, argues in like manner.

keen criticism. That had been rendered easier than it might have been by the unscientific haste with which Price had seized on any argument or any apparent fact which seemed to favour his cause; a failing, rendered the more apparent by the pertinacity with which he clung to any argument once adduced.

The positive data which were collected by these two writers, irrespective of that incidentally brought forward in the destructive portion of their pamphlets, related to two matters, the increase or decrease of the population, and secondly, its actual numbers. It is most fully stated by Howlett, who had the advantage of consulting Wales' figures before the publication of his own, and who, in one case, at least, incorporated the two in one table. They were criticised by the anonymous author of the *Uncertainty of the Present Population of the Kingdom*,⁴⁴ and by Price in the Fourth Edition of *Reversionary Payments* (1783).

As to the subject of increase or decrease the evidence adduced is of two kinds, consisting in the first place of actual enumerations of houses at different times; and, in the second, of calculations founded on the statistics⁴⁵ of burials and baptisms. A table⁴⁶ illustrating the first is submitted by Wales, who had sent out a large number of circulars to different parishes⁴⁷ asking for information as to the number of houses respectively in 1750, and at the time of his inquiry (1779-1780). The replies may be stated as follows:—

	1750.	1780.
Yorkshire, N.R. (29 returns)	1,716	1,985
Derbyshire (17 returns)	1,001	1,348
Northampton (27 returns)	1,036	1,024
Suffolk, families (14 returns)	653	704
Sussex (4 returns).....	144	223
Somerset (4 returns).....	428	388
Yorkshire, 8 villages, W.R.	4,978	5,672
„ Agbridege and Morley division *	784	913
	17,764 (1761)	21,929 (1779)
	23,526	28,544

* These are the returns specially verified of the district surveyor for the assessed taxes. His information Wales was inclined to trust.

⁴⁴ London, 1781.

⁴⁵ Statistics such as these, adduced on both sides of the argument, assume that there is no disturbing cause to occasion any essential alteration in the ratio existing between the population and births and deaths. The possibility of such, and the probability so far as a few localities are concerned, prevent the statistics to be cited from being taken as a basis for more than approximate conclusions.

⁴⁶ Wales, pp. 35—48.

⁴⁷ Wales, p. 6.

Of the other kind of testimony there was a considerable amount. From Wales we have a table⁴⁸ of baptisms and burials for 142 parishes of all kinds, giving the average first for the period 1740–1750 and next for that of 1765–1779. Baptisms increased from 4,712 to 7,179, and burials from 4,067 to 5,689, or combining the two, in a ratio approximating to that of 7 to 10. Another table⁴⁹ is drawn up from information furnished by a friend, according to which annual baptisms and burials for 26 parishes in the ten years prior to 1754 were 1,157, in the ten years subsequent, 1,180; while in the diocese of St. David's the mean of the annual baptisms and burials⁵⁰ was during the period 1730–1760, 1,667, and during that of 1760–1763–4, 1,846. Howlett⁵¹ supplies information gathered from entirely different sources. Special statistics for two five-year periods were obtained from 162 parishes in all parts of England, according to which:—

	Period of five years beginning 1758-60-61.	Period beginning 1773-75-76.
Baptisms (total) were	47,638	59,567
Burials (total) were	49,553	53,030

As, moreover, Price had chosen to lay great stress on the probability that England and Wales had been decreasing in population since the Revolution, particular evidence from vital statistics was adduced in refutation. This is best summed up in a table⁵² furnished by Howlett, who, to make the result as wide as possible, combines Wales' results with his own. Both of them took the annual average of baptisms and burials for two periods, the one about the time of the Revolution, and the other shortly antecedent to the time at which they were writing. In the case of Wales, these periods are usually for a number of years, varying from seven to ten, while Howlett almost invariably takes his average for every twenty years. Taken together, the accounts presented represent the case in a total consisting of 308 parishes, 270 furnished by Howlett, together with Norwich and the two

⁴⁸ Wales, pp. 53–61.

⁴⁹ Wales.

⁵⁰ Wales.

⁵¹ Howlett, *Exam.*, p. 131.

⁵² The summary is given; Howlett, p. 128. The figures given in the summary, though differing but slightly, do not always exactly correspond with those given by Howlett in the minute accounts of each county (pp. 98–130). It is possible that new figures were received and a few corrections made while the pamphlet was in the process of printing. The differences are very trifling.

dioceses of St. David's and Chester, the latter of which was, at that time, very large, and according to them the annual

	First period.	Second period.
Baptisms were	21,192	38,899
Burials were	19,090	31,455

The criticisms which the foregoing figures met with from Price and the author of the *Uncertainty*, &c., do not seriously impair their value. The former indeed, in treating⁵³ of the summary last given, declares it to be of little, if any, value, but his mode of proving that such was the case was to omit several county returns, and then to dismiss the rest on the ground that the births were exceeded by the deaths. This criticism is much more applicable to the table giving totals for recent quinquennial periods. It is, of course, possible that despite the general increase some of the counties, and especially the southern counties, were at one time and another diminishing rather than growing, but such a fact was not inconsistent with the conclusions which both Howlett and Wales sought to establish. The author of the *Uncertainty*,⁵⁴ whose general criticism was endorsed by Price, attacked Wales' account of the growth in houses between 1750 and 1780 on the ground that many of the parishes and returns related to Yorkshire, where he remarks that increase is generally admitted. Though a large proportion refers to Yorkshire, it must be noticed that even without those relating to Yorkshire there is increase, while the remark is peculiarly unfortunate when proceeding from those who were giving a great deal of credit to tax returns according to which the assessed houses between 1759 and 1777 increased in Yorkshire from 70,658 to 71,596, and in England and Wales from 679,149 to 682,077. If the rates of increase respectively in Yorkshire and the rest of England and Wales be drawn from the number of assessed houses and from the summary of recent burials and baptisms in two periods, these will be in the former case 1·3 per cent. and ·3 per cent., and in the latter 31 per cent. and 9·2 per cent. According to these figures the table is slightly, but only slightly, overweighted with northern parishes, and its validity for the purpose for which it was formed remains practically unimpaired.

The one thing which militates against the full acceptance of the evidence thus presented and prevents the extension of its results to the whole country in any but the most general way comes not from any suspicion of unfairness in the selection of the parishes to which reference is made, but from their numerical insufficiency for a

⁵³ *Reversionary Payments*, fourth edition, vol. ii, p. 306, &c.

⁵⁴ *Uncertainty*, pp. 14—16.

precise conclusion. Though when taken in conjunction with proofs as to what had happened in certain special cases,⁵⁵ they are enough to indicate increase, it seems impossible to go further and to claim that they necessarily represent the rate at which such increase was proceeding.

To ascertain the actual number of the population the method adopted both by Howlett and Wales, and partially recognised by Price, consisted in taking the respective numbers of assessed houses and of specially enumerated totals of houses for a number of parishes and places and applying the ratio thus ascertained to the whole country. By this means a total was found which differed very widely from that conjecturally furnished in the official returns. The relation thus discovered between assessed and total houses obviously holds good only for the period during which the inquiry was made. According to the accounts furnished to Howlett⁵⁶ from 103 parishes, while assessed houses were 19,025, the total was 33,096. Wales'⁵⁷ results show assessed houses, 25,242 and total 41,724, to which Price⁵⁸ adds, from a source which he considered trustworthy, a short list in which the figures are respectively 11,219 and 17,992. If an addition be made the assessed houses in the three returns are 55,486 and the total enumerated 92,812, applying which results to the charged and chargeable houses in 1777, 701,473, we have a total, in round numbers, of say 1,175,000. It was here Howlett made a portentous blunder, for having obtained the relation between assessed houses and totals he applies it not to charged houses not to charged and chargeable together, as is done above, but to the totals as they appear in the surveyors' returns. So the critic was criticised⁵⁹

⁵⁵ The inhabitants of 10 towns, taken by enumeration for a year in or about 1760 were 101,214, and for same for a year in or about 1770, 168,411 (Wales); likewise London is reckoned by same writer to have increased since Revolution in proportion of 9 to 10 (pp. 24, 68).

⁵⁶ Howlett, *Exam.*, pp. 139—142. The accuracy of these were impugned by Price, but for reasons already stated they may reasonably be accepted. It is interesting to note that the proportion they go to establish differs very little from that presented by the figures given by Wales.

⁵⁷ Wales.

⁵⁸ Price, *Reversionary Payments*, vol. ii, p. 284.

⁵⁹ *Uncertainty*; Price, *Reversionary Payments*, vol. ii. Sir Ernest Clarke has, since this paper was read, drawn my attention to a letter written by the Rev. John Howlett from Dunmow, on April 23, 1797, six years after Price's death in 1791, and seven years before his own death in 1804. This letter was in reply to an inquiry made by Mr. John Middleton, a surveyor who was then engaged in a study for the Board of Agriculture of the agriculture of Middlesex, and it was published in Middleton's Official Report of 1798 (pp. 562—7). After an acknowledgment of Middleton's letter, which no doubt had special reference to the population of London, Howlett starts off thus:—

“And now I am set down for that purpose, I will begin by correcting my own

and with a severity which, considering the magnitude of the error, was well deserved. If the results obtained above be applied, as in Howlett's case seems certain, only to the charged houses, 682,077, the total is reduced to closely 1,170,000.

Before this calculation could be used for the determination of the population, the average of persons to the house had to be settled. On this point there was considerable difference of opinion both at that time and afterwards. Price placed it at something under 5. Howlett, from a summary of inquiries, including information adduced by Price, so far as this was specific, gives it for the places taken into account $5\frac{2}{3}$, and by making allowance for the greater density of the population of the metropolis, the average was raised to $5\frac{2}{3}$, a number corroborated, as Sir F. M. Eden pointed out, by other investigations. The County Report on Suffolk to the Board of Agriculture assigns $5\frac{1}{4}$ to the house. This figure ($5\frac{2}{3}$) is generally confirmed by the figures of the Census Returns of 1801, according to which the number was 5.64.⁶⁰ Multiplying the number of houses by $5\frac{2}{3}$, the population of England and Wales in 1777 appears as 6,630,000. The relevance of this to other estimates will be discussed later.

At present it is necessary to sum up the conclusions enabled by the foregoing account.

Firstly, the returns published by the Window and House Tax Commissions do not in themselves afford a satisfactory basis for estimates of the population at *different* periods. This was due to

"errors, with respect to the population of the Kingdom and that of the metropolis in particular. The former, in my examination of Dr. Price's essay, &c., I made to be between eight and nine millions. This estimate was formed upon principles so extremely unfounded, which I did not then know, but very soon discovered, as rendered the final results extremely erroneous. From a more minute and accurate investigation of the subject, about fourteen years ago (which I intended to publish, but did not, and I believe never shall), I am nearly confident our population did not *then* amount to seven millions and a-half, and that at present it does not exceed eight millions. It is somewhat extraordinary, that the fallacy which misled me, neither the public nor the keen, penetrating eyes of Dr. Price ever saw. The Doctor indeed pointed out a misapprehension which he supposed me to be under: but that was entirely groundless. With regard to the number of inhabitants within the London bills of mortality, I confess I felt no small degree of confusion, upon finding I had asserted they were between 800,000 and 900,000, having long been inclined to think that they had never yet amounted to 700,000. I have turned to the passage in which I have given my estimate of 800,000 or 900,000, and find the reason upon which it is founded too vague and precarious to be safely depended upon."

This letter, as will be seen, confirms the estimate given in the text.

⁶⁰ Number of persons to a house in England and Wales was—

1801.....	5.64	1811.....	5.65	1821.....	5.74	1831.....	5.6
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two things. Whatever may be thought of the return of assessed houses, the estimate of cottages or empty houses seems quite valueless. But even the assessed houses are open to attack. Evasion took place to an extent which cannot be reckoned; increasing regularly as the tax increased, or owing to human ingenuity and official negligence.

Secondly, these returns possibly may be of some value if supplemented by actual enumeration in a sufficient number of places, it being assumed that the houses charged and chargeable would stand in the same relation to the total on the average as in the instances embraced by the enumeration. Here, of course, the point at issue is the number of instances and their representative character.

Thirdly, the Hearth Returns require some consideration on one point—their relation to families or tenements; while the calculation given by Gregory King on the population needs examination in respect of the number of persons to the houses.

Fourthly, the points of original controversy may be taken as decided in one way. Not only had there been an increase of the population during the century, but increase had taken place during the third quarter. On the other hand, the extent of the increase and its distribution throughout the country were not determined. Both controversies resulted in the complete refutation of the proofs adduced by the prophets of evil.

A further comment, or conjecture, as to the population was supplied by Sir F. M. Eden in the very ingenious pamphlet which he published on the eve, as it were, of the first Census, in which he gives details as to baptisms, marriages, burials, assessed houses, and population, in a series of tables relating to different districts. These details were derived from enquiries made, as a rule, during the period 1788-95. The eight tables are interesting, though the number of returns is somewhat inadequate for more than general conclusions. One of the estimates of population offered comes very near to that returned at the Census. Eden, indeed, gives two estimates—one, that referred to, for 8,935,000, and another for 10,005,000. Even the latter seemed to him an underestimate.

II.

The materials which are present for the purpose of determining the population both of England and Wales as a whole, and of the various counties and districts, and also the rates of increase, fall under two headings. Firstly, there are certain estimates of population formed at certain epochs; secondly, there is an amount of information of a miscellaneous character largely relating to increase

at particular periods. Of this much is drawn from returns as to baptisms, burials, and marriages in different parts of the country.

With regard to estimates of populations, for reasons already given, those formed directly and solely from the returns to the House and Window Taxes have been discarded. This does not apply to Howlett's estimate of 1777, when, while these are taken as a basis, actual enumeration is relied on to give a factor of error, the assumption being made that the instances taken are numerous enough and sufficiently representative to indicate the error for the whole country.

The estimates, then, which present themselves for consideration are three, namely, those based on the Hearth Tax Returns at the close of the seventeenth century; that by Howlett for 1777, and those furnished from inquiries made by Mr. Rickman and published in the introduction to the Census of 1841. None of these are without some drawback or uncertainty.

The defects in the estimate of the population given by Gregory King, or as to any one which may be formed from the statistics given either by him or by Houghton, are two. In the first place, the criticism by William Eden as to the application of these returns to the number of families rather than of houses seems valid. Not only are the general grounds adduced by Eden strong, but Gregory King's own testimony, already cited, is supported by his own calculation. He deliberately tries to correct the number to make it apply to tenements. In the second place, his calculation as to population is reached by a multiplication of the number of houses by a number of persons per house according to a scale which cannot be checked now and could not be known to him as accurate then. As a matter of fact the number of persons per house assigned by him seems open to very grave doubt. It is difficult to understand how he could estimate the number of persons accurately, distinguishing as he does between the metropolis, towns and the country. The numbers which he does assign are fundamentally different from those which appear at the time of the Census Returns in 1801, or at those earlier dates when the controversy took place. At best his results are a rough approximation. There is, however, no ground for discrediting the figures which he furnishes and which he used as his basis. The point at issue is not the figures themselves but their interpretation. The probability that Gregory King and other writers like Davenant were indefinite in their use of the term "house" is considerably increased by the statement of the former that he proportions "the number of souls" to a house, according to what we have observed from the said "assessments of marriages, births, and burials in several parts of

“the kingdom.” Figures derived from such sources would relate more to families than to tenements. On these grounds it seems that a better use of the figures under the Hearth Tax is to take the original figures as tending to indicate households, and to make the corrections necessary for this purpose. An allowance has to be made on the one side for omissions from the returns and on the other side for premises such as “blacksmith’s shops and empty houses,” and the like. King makes an allowance for the former of 104,460 persons in his estimate or, taking the “house” figures, of something between 20,000 and 25,000. His allowance on the other side cannot be stated as it is mixed up with that made to eliminate the “divided” houses. If we take the population of empty to total houses in 1801, the percentage is a little over 3, and making some small allowance for premises such as blacksmith’s shops, 3·5 may be reached. On such a basis as this a deduction of about 50,000 from the figures in question might be made, making the net deduction from the 1,319,000 something like 30,000. As a matter of fact this is not very different from King’s figures of 1,290,000 (to be taken in round numbers at 1,300,000), though his figures are increased to apply to 1695 instead of 1690. As to the number whereby this must be multiplied to arrive at the population, some guidance is afforded by the figures in the Census Returns. Taking the earlier years the numbers of persons to the family is as follows :—

1801	4·6	1811.....	4·7	1821.....	4·8
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With regard to this it would seem that some allowance should be made for the difference between the beginning and the end of the eighteenth century. If the number for the earlier date be taken at 4·5, the population for the year 1690 would work out in round numbers at 5,765,000, while if 4·4 be taken, the number would in like manner be 5,662,000. Taking the former, the difference between King’s estimate for 1695 of 5,500,000 and that thus arrived at for 1690 of 5,765,000 is not considerable. There seems no doubt, indeed, that King, in his attempt to reduce the figures to those which hold good for actual houses, falls into some confusion. The really important matter, however, is the approximation between the two results. Despite the arguments by Eden and Howlett there seems no valid ground for regarding King’s estimate as an over-estimate. Indeed, the contrary seems probable. As to the amount to be allowed for the difference in date, King considers that the annual increase in people may be put at 9,000. If we turn to the annual increase, according to Mr. Rickman’s figures, that works out at roughly 10,000. If an increase of this

kind be assumed, the population in 1700 would be, according to King's method, 5,550,000, and according to that adopted in this paper, 5,860,000, the numbers in both cases being given in round figures.

The method employed by Howlett in framing his estimate for 1777 has been fully described. Its reliability depends on the extent to which the returns which he summarises are representative. So far as the lists respectively go, the disproportion between the houses assessed and the houses actually enumerated is considerable. In the respective lists the error stands as follows:—

	Enumerated houses.	Returned.	Increase in first column.
			Per cent.
Howlett	33,096	19,025	73
Wales	41,724	25,242	65
Price	17,992	11,219	60
	92,812	55,486	67.5

It is difficult to determine how much reliance can be placed on this percentage difference as representative of the country as a whole. As Chalmers pointed out, if the dwellings of the poor escaping taxation stood in the same proportion to charged and chargeable houses in 1781 as in 1790, the number would have been 865,000;⁶¹ while Forster, again, in his enumerations of some few villages, found less than one half returned. This latter is based on too few returns, while the former computation leaves out of count changes in building. Taking the figures adduced by Howlett, towns are apparently less represented than rural places. On the other hand, there seems little reason for assuming greater error in this case than in any other.

Turning next to the estimates published in the *Introduction* to the Census for 1841, we come to calculations of quite a different order. These are based on the answers to a circular sent out to every parish, requesting returns as to baptisms, marriages and burials at certain epochs. These, as explained in the *Introduction*, were to be for three years at the given date, and due allowance being made for cases of default and the like, figures are deduced from these both for the whole country and also for the several counties on what seems to be the assumption that population stood to the average of baptisms, marriages and burials in the same ratio at the respective dates as in 1841, or thereabouts. On this calculation the population of England and Wales was 6,045,008 in 1700,

⁶¹ *Estimate of the Strength of Great Britain* (1802), ii, p. 220.

and 6,517,035 in 1751. The assumption, however, as to the ratio of the population to baptisms, marriages, and burials may be questioned. If, for instance, population is calculated from births, marriages and deaths in 1841 according to the ratio held in 1891, there would be an error of something like 15 per cent. On the other hand, it may be doubted if any changes were in progress in the eighteenth century at all commensurate with those in the above half century. On the whole, it seems possible that some *small* allowance should be made with the result of diminishing the estimates at the early dates. This might be put at 3 per cent. for 1750 and 5 per cent. for 1700. In that case the population would be in round numbers :—

1700	5,740,000		1750	6,320,000
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The correctness of the deduction is, of course, uncertain. It is conjectural. On the other hand, there seems no particular reason for assuming that in the eighteenth century baptisms and burials would vary greatly as compared with births and deaths in respect of a relation to the population.

On the above examination of the materials, the estimates of the population may be set out as follows :—

1700.		
King's estimate (1695),	5,500,000 + 50,000	= 5,550,000
„	corrected, 5,765,000 + 100,000	= 5,865,000
Rickman's estimate		6,045,000
„	corrected	5,740,000

Note.—Houghton's number, or rather an estimate formed on that which he gives for houses, is not given, as there is nothing to say whether this should be attributed to houses or families, or whether divided houses are omitted. If it were taken as basis in place of King's, the population might be 5,220,000.

From these varying estimates it would seem that the population would lie between the extreme limits of 5,550,000 and 6,045,000, and in these discussions might be reckoned at in round numbers 5,750,000 or 5,850,000.

1750 and 1777.		
Rickman's estimate (1750)		6,517,000
„	corrected (1750)	6,320,000
Howlett's calculation (1777)		6,630,000

One thing seems quite clear, namely, the incompatibility between Rickman's estimate and that given by Howlett, since in addition to all other difficulties it suggests that whereas population during the first half century increased by half a million, the increase in the next quarter was but little more than 110,000. But are Howlett's figures much more compatible with the amended estimate for 1750 and the Census figures for 1801, that is 8,892,300 ?

The matter is one of much more than speculative interest inasmuch as it influences our judgment as to the time when the country began to be deeply affected by the great changes in occupation.

Initially it would seem improbable that the annual rate of increase should be about 12,000 from 1750 to 1775, let us say, and about 90,000 from 1775 to the end of the century, but then it must be remembered that during the whole of the first half century it seems undoubtedly to be 10,000, while during the second half century it is about 50,000. Again Howlett and Wales both give figures of baptisms, etc., showing a considerable increase during the earlier decades of this half century. On the other hand it must be remembered that the population of England and Wales increased 14 per cent. 1801-11, and 18 per cent. 1811-21. In weighing this somewhat heterogeneous mass of evidence what has already been said as to the conclusions to be drawn from the rates of baptism and burial in a small number of parishes must be borne in mind. The number is too small to be conclusive as to the *rate of* increase, as it is impossible to invest them with any representative character. Possibly they point to an under-estimate in the calculation as to the population of 1777, but they cannot be taken as proving that that was very great. There is, of course, a great difference between the degree of reliance to be placed on the figures now under consideration and that given to the estimate of error between the houses assessed and those enumerated. Then the nature of the error was common, and consequently the parishes, though comparatively few, were in a sense representative, or at any rate might be representative. In the present case this is obviously not so. On the whole the estimate for 1777 may be taken as supporting the view that the great growth of population was after that time, or more roughly, after 1770. This is certainly supported by the rate of increase in the first decade of the nineteenth century, which seems to warrant the assumption that the rate in the last two decades or so was 14 per cent. On the other hand, it may be added that it is very probable that Howlett's estimate as to the error between the actual houses and those returned fails to take sufficient cognisance of the great escape of houses in the rising manufacturing counties. In view of this the 6,630,000 requires some addition.

After this examination and these criticisms the following statement as to the population seems fair :—

1700.....	5,800,000 (5,550,000—6,000,000)
'50.....	6,320,000 (6,300,000—6,517,000)
1800.....	8,890,000

while it may be added that during the second half century by far the greater increase takes place in the last twenty-five years.

Taking the population in 1750 at 6,320,000 and assuming considerable under-estimate by Howlett, the population in 1777 may be, on conjecture, raised to 7,000,000, or thereabouts. Thus the increase in the first twenty-five years is about 10 per cent. and that in the second about 27 per cent., this latter increase seeming by no means out of proportion to the rates achieved in the early decade of the succeeding century.

While there is a certain element of conjecture in all the estimates, the degree of coincidence between the accounts is more surprising than their difference.

Of equal importance with the actual population itself is a knowledge of the difference in the rate of increase between different portions of the country. Here, fortunately, many of the corrections which have been attempted and much of the criticism which has been adduced can be put on one side since a similarity of error, if error there be, may be assumed uniformly. The best figures for this purpose are those collected by Mr. Rickman, even though these may be considered, as pointed out above, to slightly over-estimate the population in 1700 and 1750. For the sake of comparison, the county figures of houses or families furnished by Gregory King and Houghton are added. That of King is taken, and after a deduction of 2 per cent. is multiplied by 4.5 to give the population. A comparison of the figures thus obtained with those given by Rickman shows, that with the exception of the northern counties, those by London, and some in the west, differences are comparatively slight. The metropolitan counties are affected by a difference in the method of treating London, that is, by its inclusion in Middlesex,⁶² to the considerable diminution of Kent and Surrey. The northern counties suffer in early lists both from defective knowledge and also, it would seem, to some degree, and in certain cases from uncertainty as to boundaries. A like want of knowledge and want of care may have affected early returns for the west. On the whole these early returns thus materially increase confidence in the figures given by Rickman. But apart from their absolute reliability there is no reason for doubting these for purposes of ascertaining the rate of increase especially for comparative purposes. The percentage rates of increase for the various counties can be given with considerable assurance, as far as the contrast between different areas and districts is concerned. To these must be added the density of population in the various counties at 1700, 1750 and 1801 respectively.

⁶² Rickman's figures for Middlesex in 1700 are inexplicable even on this assumption.

An examination of the table thus drawn up shows certain important results.

In the first place, there is a remarkable difference between the counties as to relative densities at the different dates. With industrial growth and the use of capital alike in manufacture, trade and agriculture, the earlier uniformity gives place to greater variety and unevenness in the distribution. This change, which is shown in detail in the table, may be briefly summarised. Excluding Middlesex and Surrey, on account of their obvious connection with London, in 1700 the county lowest in density has 54 people to the square mile, and that highest 141; in 1750, the figures are 51 and 179 respectively, while in 1801 they are 55 and 353. But the distribution, according to densities, may be put in another way—

Distribution of counties (38) according to their density of population to the square mile.

	51—75.	76—100.	101—125.	126—150.	151—175.	176—200.	201—225.	226—250.	251—.
1700	7	9	18	4	—	—	—	—	—
'50	5	7	14	9	2	1	—	—	—
1801	3	2	6	12	8	3	2	1	1

Here there are two things to observe; not only has the centre shifted considerably, but the distribution extends over a much wider area. The latter alteration is particularly noticeable in the last row of figures. It is evidence to be put with much other evidence of the great industrial development which took place in the latter half-century.

In the second place, an equally important change takes place in the position of the respective counties as to density. This can be best seen if these be set out in parallel columns in the order of density at the respective dates. To render comparison as easy as possible the actual figures, already given in the main table, are omitted.

Order of the counties according to density of population.

1700.	1750.	1801.
Worcester	Lancashire	Lancashire
Somerset	Gloucester	Warwick
Devonshire	Warwick	West Riding
Lancashire	Somerset	Stafford
Gloucester	Durham	Gloucester
Hertford	Worcester	Worcester
Durham	Hertford	Kent
Norfolk	Stafford	Cheshire
Bedford	Berkshire	Somerset

Order of the counties according to density of population.—Contd.

1700.	1750.	1801.
Northampton	Oxford	Durham
Oxford	Bedford	Nottingham
Buckingham	Devonshire	Leicester
Wiltshire	Wiltshire	Hertford
Warwick	Leicester	Derby
Derby	West Riding	Berkshire
Stafford	Northampton	Oxford
Suffolk	Buckingham	Buckingham
Berkshire	Essex	Suffolk
Nottingham	Suffolk	Cornwall
Rutland	Norfolk	Bedford
Essex	Nottingham	Wiltshire
Cambridge	Kent	Essex
Leicester	Derby	Northampton
Kent	Cheshire	Devonshire
Cheshire	Shropshire	Hampshire
Shropshire	Cornwall	Shropshire
West Riding	Dorset	Norfolk
Cornwall	Cambridge	Dorset
Dorset	Hereford	Cambridge
Hereford	Huntingdon	Rutland
Huntingdon	Hampshire	Sussex
Sussex	Rutland	Hereford
Hampshire	Northumberland	Huntingdon
Lincoln	Sussex	Yorkshire, E. and N.
Northumberland	Lincoln	Ridings
Yorkshire, E. and N.	Yorkshire, E. and N.	Northumberland
Ridings	Ridings	Lincoln
Cumberland	Cumberland	Cumberland
Westmorland	Westmorland	Westmorland

The features which are revealed most clearly by the study of these lists are the rise of the counties which are now the chief centres of mechanical industries and the steady decline in position, not, however, accompanied by an absolute decrease in population of the purely agricultural counties. They can be looked at separately.

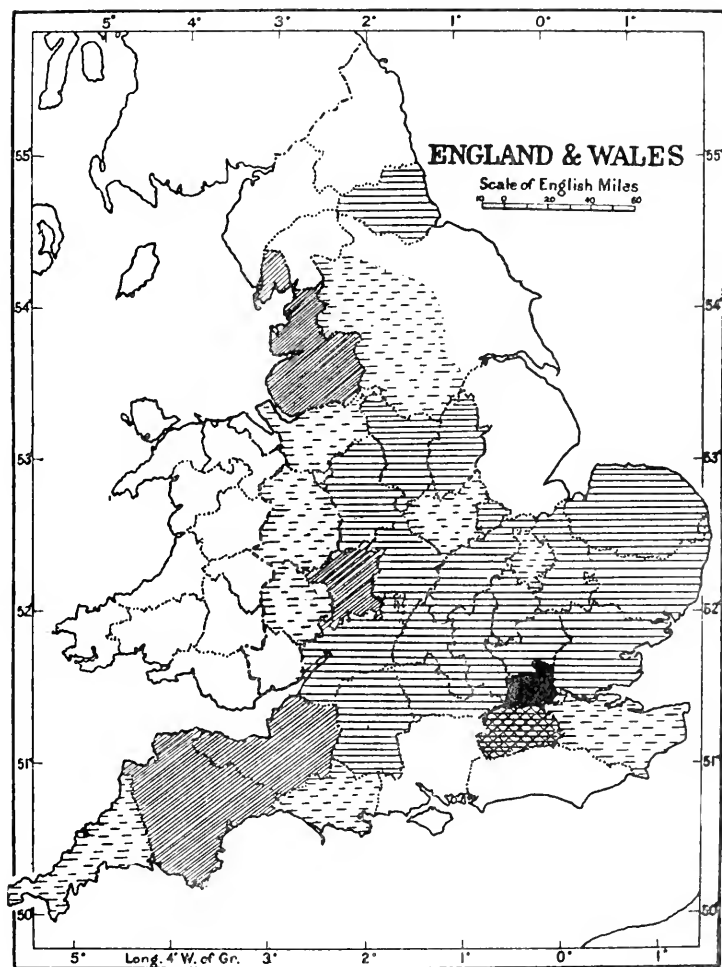
The two districts falling under the first heading are that in the textile region of the north and that forming the midland iron and metal district.

The first of these consists of the three counties—Lancashire, the West Riding and Cheshire, the last following as a necessary supplement to the first named county. For the purpose of study they are set out here with the details of density and increase.

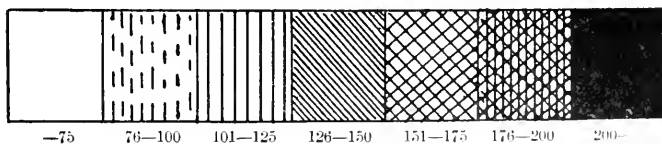
	Rate of increase per cent.		Density.		
	1700-50.	1750-1801.	1700.	1750.	1801.
Lancashire	41	97	127	179	253
Cheshire	13	65	92	105	174
West Riding.....	34	75	91	122	212

Density of population (per square mile), 1700.

(Wales and Monmouth omitted.)

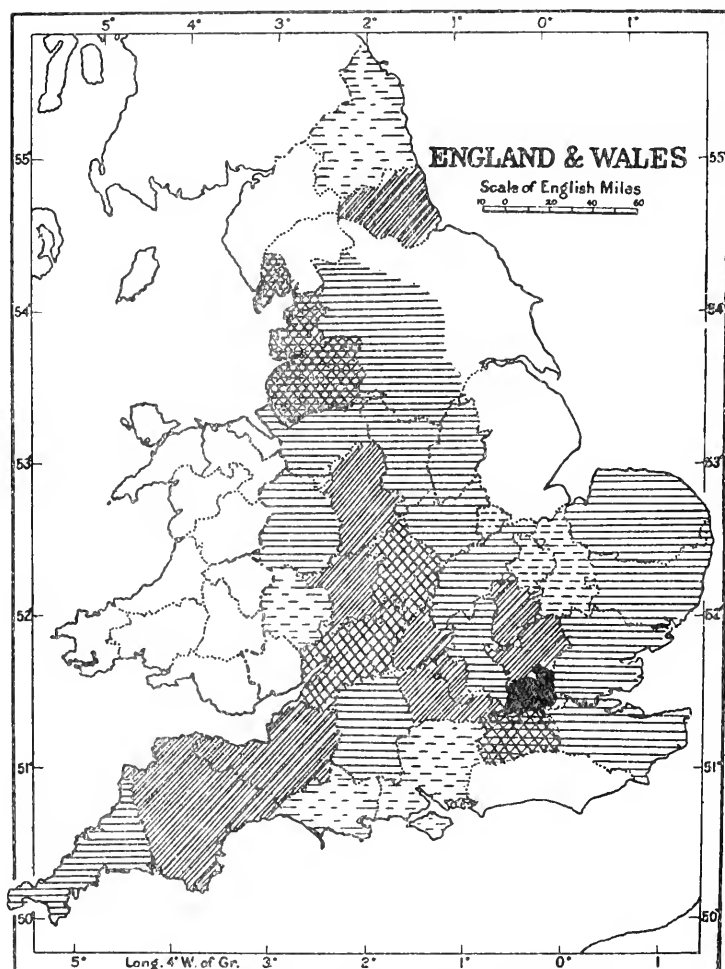


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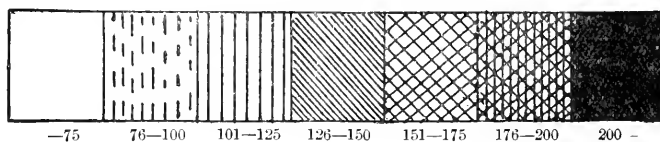


Density of population (per square mile), 1750.

(Wales and Monmouth omitted.)

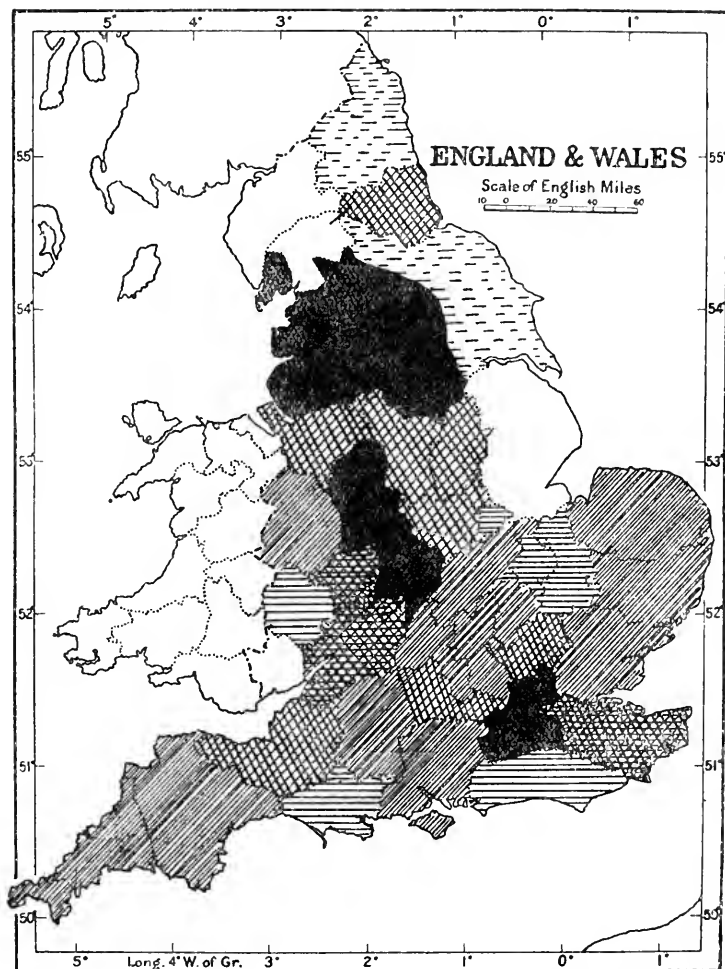


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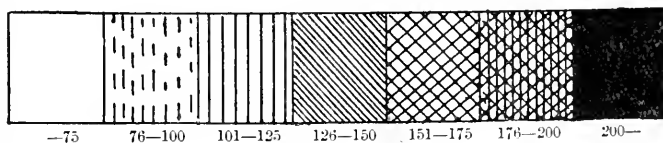


Density of population (per square mile), 1801.

(Wales and Monmouth omitted.)



SCALE.



n all alike there is some increase in the first half century, in two a great increase, and then a heightened rate in the second half. Further, both the West Riding and Cheshire stand very low in the density list in 1700.

With these should be compared two other counties, namely, Nottingham and Leicester.

	Rate of increase.		Density.		
	1700-50.	1750-1801.	1700.	1750.	1801.
Nottingham	5	53	105	111	163
Leicester	22	32	100	123	162

Both these counties rise in the lists, both increasing more rapidly, one in a startling way, in the last half century.

Turning next to the midland metal districts, the counties to be dealt with are Warwick, Worcester and Stafford.

	Rate of increase.		Density.		
	1700-50.	1750-1801.	1700.	1750.	1801.
Warwick	35	55	112	152	236
Worcester.....	— 1	35	141	139	189
Stafford	20	58	111	133	210

While the rate of increase in the second half century is greater than in the first, these counties stand on a higher level of density in 1700 than those in the preceding instances, with the single exception of Lancashire, where we know industry was developed in the seventeenth century. Further than that, with the exception of Worcester, the rate of increase in the first half century comes nearer that in the second than in the former cases, with the exception of Leicester. These signs seem to point to industry at the commencement, and industry in slightly though gradually quickened growth.

In contrast to both these may be placed a group of agricultural counties :—

	Rate of increase.		Density.		
	1700-50.	1750-1801.	1700.	1750.	1801.
Northampton	5	9	115	122	134
Cambridge	— 5	14	101	95	109
Huntingdon	1	15	89	90	104
Rutland.....	—19	30	104	80	109
Bedford.....	10	6	116	129	138
Buckingham.....	15	22	115	120	147
Berkshire	18	17	110	131	155
Oxford	12	14	115	130	148
Lincoln	— 9	26	65	59	75
Shropshire	13	24	92	104	130
Hereford	7	17	90	91	107

The first thing that appears is the striking fact that, excluding Huntingdon and Lincoln, both easily accounted for, on the one hand, and on the other the two western counties, the agricultural counties present nearly as high a density in 1700 on the average as those dealt with already. Secondly, in many cases the rate of increase in the first half is not very different from the rate of increase in the second half. Taking all of these together, the later increase is greater.

There are, however, two other groups of counties which require notice, namely those which formed the early manufacturing regions in the east and the west respectively—

	Rate of increase.		Density.		
	1700-50.	1750-1801.	1700.	1750.	1801.
Norfolk.....	—3	15	116	112	129
Suffolk	4	22	110	116	142
Essex.....	13	16	103	117	137
Gloucester	38	15	125	173	199
Somerset	10	9	113	125	137
Wiltshire	10	14	132	144	165

In the first group, conclusions, while somewhat difficult to form owing to the probable interaction of industry and agriculture, appear to indicate a decrease in manufacture and an increase in agriculture. On the other hand, in the second group, the signs conform in the main to those to be expected from counties with slow industrial progress. Without doubt they are surpassed in growth by the northern counties, but still they start from a high density and undeniably progress.

Among other counties the change in the position of Devonshire is very interesting. It corroborates the account of the woollen industry in that county even in the seventeenth century, and certainly would point to the decay of any such occupation. The density of population remains much the same.

In dealing with the agricultural counties, it is interesting to compare the density of population with the position attributed to such counties in 1811 as to proportion of agricultural employment. Though there is little doubt that the actual percentages of such employment as given then for all counties cannot be accepted, still the relative position of the counties is probably approximately correct. The six leading counties in respect of agricultural employment were in 1811, Bedford, Hereford, Cambridge, Huntingdon, Lincoln, and Rutland. All of these stand low in density in 1801, and all *taking the century as a whole* exhibit a low rate of increase as compared with most other agricultural counties. This low rate is more noticeable in the first half century, in the second half century the rate being normal.

Census return, 1841, &c.

Population according to inquiries.

Number of houses
according to returns to
Health Tax.Population
estimated
on
King's
return.

Number of houses according to returns to Health Tax.			Population estimated on King's return.	Population according to inquiries. Census return, 1841, &c.							
G. King, 1680.	Houghton, 1691.	Population, 1700.		Population, 1750.	Rate of increase, 1700-50.	Population, 1801.	Rate of increase, 1750-1801.	Density of population.			
								1700.	1750.	1801.	
Bedford	12,170	12,170	53,670	53,706	59,542	10.8	63,393		116	129	138
Berkshire	16,996	16,906	77,920	77,845	92,293	18.8	109,215		110	131	155
Buckingham	18,688	18,390	82,350	76,325	87,821	15.1	107,447		115	120	147
Cambridge	18,629	17,347	82,170	82,234	78,097	- 5.0	89,346		101	95	109
Cheshire	25,592	24,054	112,900	101,598	115,681	13.9	191,751		92	105	174
Cornwall	26,613	25,375	117,400	124,084	141,744	14.2	188,269		91	104	138
Cumberland	15,279	14,825	67,370	91,421	87,109	- 5.0	117,280		58	56	75
Derby	24,944	21,155	110,800	115,564	108,251	- 6.3	161,142		112	105	157
Devonshire	56,202	56,310	247,900	335,667	329,398	- 1.9	343,001		130	127	133
Dorset	17,859	21,944	78,700	88,628	94,909	7.1	115,319		90	96	117
Durham	53,345*	15,984	235,250*	114,272	139,799	21.4	160,361		117	144	164
Essex	40,545	34,819	178,830	170,842	193,932	13.5	226,437		103	117	137
Gloucester	34,476	26,764	152,010	157,348	218,149	38.7	250,899		125	173	199
Hampshire	28,557	26,851	125,950	109,829	144,159	31.2	219,656		65	86	131
Hereford	16,744	15,006	74,290	75,229	75,682	0.7	89,191		90	91	107
Hertford	17,488	16,569	77,170	73,539	82,163	11.5	97,577		120	134	160
Huntingdon	8,713	8,217	38,430	31,966	32,516	1.6	37,568		89	90	104
Kent	46,674	39,212	205,830	157,833	181,267	14.9	307,624		97	111	189
Lancashire	46,961	40,202	207,090	242,014	341,451	41.1	672,731		127	179	353
Leicester	20,448	18,702	90,180	80,210	98,488	22.8	130,081		100	123	162

* Including Northumberland.

DISCUSSION *on* PROFESSOR GONNER'S PAPER.

MR. REW, in proposing a vote of thanks to Professor Gonner, said that the Paper would be a most useful contribution to the Society's transactions, although it did not perhaps lend itself very greatly to the purposes of discussion. They recognised in this Paper those qualities of conscientiousness, lucidity and impartiality which were so conspicuous in the great work which Professor Gonner had recently published on "Common Land and Inclosure." The earlier part of the Paper suggested that Professor Gonner was dissecting with somewhat merciless skill the well-intentioned efforts of persons in those days to construct statistical bricks without statistical straw, a process which might be fascinating and the results of which might be attractive—so long as one did not want to use the bricks. Some of the statistics referred to in the earlier part of the Paper might almost be described as flights of imagination. Some of the statistical methods employed also seemed to be rather more ingenious than convincing. If he understood rightly, one of the authors referred to seriously founded his calculations of the increase or decrease of the population on an examination of the burial figures alone, a process by which one could readily demonstrate that the greatest increase of population in this country occurred at the time of the Black Death! One was also struck with the scorn of those gentlemen for the methods employed by what we might call their rivals. It reminded him of a lecture by Dr. Thorold Rogers, who, of course, made some very valuable calculations with regard to population and other matters in the Middle Ages and at other periods. On one occasion he was very contemptuous of the estimates made by certain statisticians of the English population in the Middle Ages, and he claimed that he could give the population with practical certainty by calculating the amount of bread which the people consumed. He did not show any consciousness of the fact that to make that calculation he would at any rate have to guess three things—the acreage under wheat, the average yield per acre, and the rate of consumption per head. On the whole, one would imagine it was rather easier to make one bold guess at the population than to make three guesses to arrive at the same result. As Professor Gonner had pointed out, the period with which he was dealing was an exceedingly interesting one. The brilliant writer of a recently published book summarised the period thus: "As the eighteenth century drew to its close, Watt, Hargreaves, Crompton, Arkwright and other mechanical geniuses were beginning to change the face of society with the swiftness of a revolution. Population was shifting from the south to the north, and advancing by leaps and bounds in crowded manufacturing towns." That sudden development of the population was well worth such a serious study as Professor Gonner had given to it. He was not sure whether Professor Gonner had mentioned the whole of the estimates which were made by Rickman in the Census

Report of 1841, but they were in fact for the years 1570, 1600, 1630, 1670, 1700, and 1750. Of course the Paper was concerned only with the two last. It appeared that the annual rate of increase of the population, which he had roughly worked out was much greater from the period 1570 to 1630 than between 1700 and 1750, and it was still less between 1630 and 1670. Professor Gonner had already explained that he thought the estimates for 1700 and for 1750 made by Rickman were both too high. Therefore he presumed he thought the estimate for 1670 must also be too high, otherwise it would appear that the population was stationary during that time. But, as the figures now stood, it appeared that the annual rate of increase from 1750 to 1777 was about double that of the period from 1700 to 1750, while from 1777 to 1800 it was treble that of 1750 to 1777; but not even in the period 1777 to 1800 did the rate reach that for 1801 to 1811, and still less that for 1811 to 1821, as shown by the census figures. It would be an intensely interesting study to relate the varying rates of increase for each of these periods to the social and economic conditions prevailing at the time, with a view to an examination of the causes which led to the variations, which seemed to be fairly well established, in the annual rate of increase of the population during the different periods.

Sir JAMES WILSON, in seconding the vote of thanks, said the reader of the Paper had told them that among the writers of the eighteenth century who dealt with this subject some were optimists and some were pessimists. There were a good many optimists and pessimists nowadays also, and he himself had come across men of both classes in the course of his work in India, where it was of great practical importance to the welfare of the people what view was taken by those in authority. The confirmed optimists would tell them that so long as the country generally was prosperous, there was no need to worry about those who had fallen behind the rest; it was enough to aim at the greatest happiness of the greatest number, to let well alone, and to leave the weakest to go to the wall. He was glad to say that this attitude, which had been prevalent in India when he first went there, had been entirely changed, and that now special attention was paid to those classes, comparatively small in numbers, who were going downhill, and every endeavour was made to help the poor, the weak, and the wretched, and to enable them to get their share of the general prosperity. Fortunately there was a third class of inquirers into economic questions, who might be called the "seekers after truth," the men who had no particular theory to establish, but who simply wished to find out as accurately as possible what was the truth. In that class they might certainly place Professor Gonner, and, he hoped, all the Fellows of the Society. As regards the growth in the population during the eighteenth century, it would be seen from the Paper that the author estimated that the population of England and Wales in 1700 was 5·8 millions, in 1750, 6·3 millions, and in 1800, 8·9 millions, and if he might

venture to do so, he would like to add a few remarks on these estimates, although he had only been able to give a short time to the study of the subject. The most trustworthy basis now available for estimating the population in the eighteenth century seemed to be the returns of the baptisms and burials collected from almost all the parishes of England and Wales in 1801. On page 455 of the second volume of the Census Returns for that year, there was a summary of the baptisms, burials, and marriages for each of twenty-nine years of the eighteenth century. The figures were given for each year from 1780 onwards. For the first eighty years of the century they were given only for the decennial years 1700, 1710, 1720, and so on. Now, if they made the following assumptions: first, that the figures given were fairly complete and accurate; secondly, that the baptisms and burials roughly corresponded with the births and deaths; and thirdly, that there was no great excess of immigration over emigration, or of emigration over immigration for the country as a whole; then, starting from the ascertained fact that in 1801 the population was 8·9 millions, it was possible to make a fairly accurate estimate of what the population was in each year back to 1780. For the period previous to that, it was necessary to make the much larger assumption that the decennial years were fairly representative of the other years of the period, but even making that assumption it was probable that this table gave them a more accurate basis for calculating the population in 1750 or 1700 than any other materials now in existence. He had not had time to work out the calculations in detail, but, taking the figures for the decennial years of the century and striking averages for them, he had arrived at the following estimate. For the years 1760, 1770, 1780, 1790, and 1800, the total number of baptisms was 1,111,000, and the total number of burials was 901,000, giving a total increase of population in those five years of 210,000; and if that figure were multiplied by ten, it would give an increase of population between 1750 and 1800 of 2·1 millions; and, if they subtracted this figure from the 8·9 millions which was found to be the population in 1801, this calculation gave the population in 1750 as 6·8 millions, while Professor Gonner made it 6·3 millions. A similar calculation for the decennial years between 1700 and 1750 gave the total number of baptisms for those five years as 805,000, and the total number of burials 799,000, or a net increase in those five years of only 6,000. Multiplying this figure by ten would give them only 60,000 as the increase in population between 1700 and 1750, so that if the five decennial years could be taken as fairly representative of the whole fifty years, it would appear that the population of England and Wales in 1700 was practically the same as it was in 1750—that is, about 6·8 millions. It seemed fairly safe to say that during the first half of the eighteenth century the population remained between 6 and 7 millions, whereas in 1801 it was found to be nearly 9 millions. The statement of 1801 also gave a basis for a rough estimate of the birth and death rates at various periods during the eighteenth century, and of the marriage rate for every year after 1753. The figures went to show that during the first

half of the eighteenth century the birth-rate was 24 per thousand, and the death-rate practically the same, whereas during the second half of the century the birth-rate was 28 and the death-rate 23 per thousand, so that the increase of population in the second half of the century compared with the stagnation of the first half was due partly to a lower death-rate, but chiefly to a higher birth-rate. He would like to draw special attention to the statistics for the rural population. Starting with the most accurate statistics available—namely, those of the census of 1911—one found that at the present day of the total population of 36 millions, 7·9 millions were living in districts classed as rural. Going back to the year 1851, the corresponding figure was 8·9 millions. Taken as they stood, those figures meant that the number of people living under rural conditions had decreased in the last sixty years by about a million; but going further back, there was ample evidence to show that the rural population had greatly increased in numbers since the beginning of last century. The Registrar-General in his last report had pointed out that of the 635 registration districts in 1911, 105 were entirely rural with a population of 1,306,000. These same districts in 1851 had a population of 1,212,000, but in 1801 their population was only 852,000, so that in the last hundred and ten years the population of these 105 rural districts had increased by more than 50 per cent. If they took the comparison further back, they found that the population of the whole country in 1750 did not amount to 7 millions, whereas at the present day, apart altogether from the population of the towns, there were practically 8 million people living under rural conditions. It was obvious, therefore, that there had been no depopulation of the rural districts as compared with the state of things in 1750, and that the complaint sometimes made that the enclosure policy and the industrial revolution, which began to take effect on a large scale in the latter half of the eighteenth century, resulted in an extensive depopulation of the country districts could not be true for the country as a whole, as the statistics showed that during that period and also during the first half of the nineteenth century the rural population must have been increasing rapidly, notwithstanding the migration to the towns.

Sir ERNEST CLARKE said that, as having gone in the past over some of the ground covered by the Paper, he desired to express his appreciation of the skill with which its compiler had unravelled the tangled skeins of the pamphlet-controversy about the population of England, which had arisen during the latter half of the eighteenth century. As Professor Gonner had said, the opposing views expressed were the outcome of controversial rather than of scientific inquiry. The materials for a scientific statistical inquiry did not in fact exist, and those venturesome persons who, in the language of the Paper, had made "lumbering guesses" as to the population were hardly fitted by their training or experiences to compile estimates that could now be relied upon. Gregory King was by profession a map-drawer and surveyor, with a strain in him

of the herald. John Houghton, F.R.S., was an apothecary who dealt in tea, coffee and chocolate in Eastcheap, and issued a weekly news-sheet, which contained amongst other interesting items the prices of certain stocks and shares, and advertisements of sermons for disposal, sago for jelly, and even of matrimonial bargains to be arranged. The Dr. Price who had tried the patience even of Dr. Gonner was a Nonconformist minister with a large following, and was an early advocate of American independence. His divinity degree of D.D. came from Glasgow, and he likewise was a Fellow of the Royal Society in its less exclusive days. His most pertinacious opponent was also a cleric, the Rev. John Howlett, B.D., of Oxford, and incumbent of Great Dunmow in Essex. The different points of view of church and dissent were apparently reflected in the acerbity of the references made by Price and Howlett to one another. As to Arthur Young, who joined in the fray, it had to be remembered that at the time of the publication of his "Political Arithmetic" in 1774 he was a comparatively young and struggling pamphleteer, trying to eke out the scanty income from his farm at South Mimms by reporting the Parliamentary debates for the *Morning Post*, and writing essays on such subjects as the Feeding of Hogs and the Culture of Coleseed, which earned him the approbation and Gold Medal of the Society of Arts, as depicted in the frieze by James Barry in the hall in which they were now assembled. For himself, therefore, he could not feel much reliance on any of the estimates of population of England at different periods of the eighteenth century, made prior to the exhaustive inquiries on this particular point about the year 1836 by John Rickman, who had supervised the Censuses for 1801, 1811, 1821 and 1831. The elaborate calculations of Rickman had not been published when his death occurred in 1840, but they appeared in the Report of the Commissioners for the Census of 1841, and they were in the speaker's judgment the only estimates of the population at periods prior to the nineteenth century for which any degree of authority could be claimed.

Professor GONNER, in reply, said he was very much indebted for the remarks which had been made, and also for the ingenuity of the speakers who had found something, at any rate, to discuss in the Paper. As to one of the points which had been raised, the figures which Sir James Wilson had very kindly given with regard to the 1801 Census Returns were very interesting, but there was no information as to how those figures were arrived at, and he thought it was that which led Mr. Rickman to disregard the 1801 figures and undertake the inquiry which was published in the introduction to the 1841 census. That inquiry was a very careful and accurate one. It consisted not of selected cases or places, but an actual return from registers in each parish in the country uniformly for three years about the particular dates Mr. Rew had given. Of course there were some faulty registers, and this point had been very fully dealt with by Mr. Rickman who gave the estimate of the population at those various dates according to the various factors.

He was bound to say there was a great deal to be said for the selection of marriages, certainly as against burials, which would obviously be a very bad test by themselves. The only point on which he would suggest a correction was that an estimate ought to take into account the different ratio borne by these factors to the population at different times. He thought, therefore, there ought to be certain allowances made. He had not made anything like the allowance which would have to be made if one took the figures, for instance, between 1841 and 1891, which he had mentioned, but he considered that Mr. Rickman's figures put them under a great obligation. He wished to say that he did not strain the figures, seeing the degree of coincidence between the early estimates and Rickman's figures. Of course, the two authorities started from entirely different standpoints. They took entirely different material and they certainly treated the material entirely differently. There was no doubt that taking the earlier writers dealing with the tax returns their evidence strengthened the estimates which were given by Mr. Rickman. What had suggested itself to him throughout was that if they had so much difficulty in ascertaining the population of the eighteenth century and the alterations in the population, what would be the possibility of like estimates with regard to the population at earlier dates. In the case of the eighteenth century they could get certain checks one against another. They could test certain of their figures. If they went back to the time about which Mr. Thorold Rogers was writing and which Mr. Rew had quoted, they had really no check whatever. The late Dr. Price was quite the most untrustworthy of writers at the end of the eighteenth century. He did not know anything worse than Dr. Price's attempt to ignore the absolute corrections into which he was forced by Howlett and Wales. He did not say that Howlett's language was polite or seductive. It certainly was not; but on most of the points Price was clearly in the wrong, and he had never found that Price had once admitted the error, even when it was made so plain that it was somewhat furtively adopted in subsequent editions of his own book. At one time Dr. Price had got the population of England down towards 4,000,000, and it had been going down in his previous estimates. Every year saw a further decrease, and if it had gone on at that rate there would have been no one left in the towns or country in the early part of the nineteenth century. With regard to urban and rural population, they were much indebted to Sir James Wilson for what he had pointed out. The only difficulty in calculating what might be rural and urban population was, that in the later census returns the definition had become rather an arbitrary and administrative one. In some cases the urban districts were almost rural, and in other cases a rural district was very urban. He thought the most trustworthy method was to take absolutely rural places which were rural now and always had been rural, and seeing what their later population was. He was quite convinced that what Sir James Wilson had summarised was true. If such places were taken for a long period of years it would be found that the population had undoubtedly

increased as years had gone on, that rural pursuits, notwithstanding alterations, afforded substantially a larger amount and a more varied kind of occupation than they formerly did. Under the system of agricultural occupation in the middle of the eighteenth century there was comparatively little continuous agricultural work, and consequently there was a certain migratory class of labourers passing up and down the country, as they knew, indeed, from records of the actual times. They were only needed at certain periods. Of course now, as they knew, more were needed at certain periods than at others, but this was much more the case in earlier times. He thanked them for their attention to the Paper, and assured them that the task had been a very interesting one. He hoped the Paper would be of some use as setting out the state of their knowledge with regard to the population during the eighteenth century. For the sake of the Society as well as for his own sake, he only wished that the information was more precise, because he felt very much when working at the eighteenth century the need of accurate knowledge of the shifting of population which must have been going on in the different districts, especially from 1750 to 1800. Personally he did not believe they would be in possession of more information and knowledge on that subject in the future than at the present time.

The following candidates were elected Fellows of the Society :—

A. A. Barriol.

W. R. Macready.

Mrs. Wood.

NOTE ON URBAN AND RURAL VARIATIONS ACCORDING TO THE
ENGLISH CENSUS OF 1911. By THOMAS A. WELTON.

THE most important new factor made known to us by the Census of 1911 is the tendency towards loss of population by migration in the case of several of our largest cities. The next in importance is the diminished loss of the rural districts by migration, which again may be connected with lessened attractions in London and elsewhere.

The volumes just published do not assist us in determining the local "natural increase" of *the sexes separately*, but the ten annual reports of the Registrar-General, with the aid of an assumption that the local proportions of male to female births have not materially changed, enable us to arrive at a close approximation to the net losses and gains by migration.

That it is indispensably necessary to deal separately with the two sexes will be admitted by anyone who considers the dissimilarity of their migrations, arising from the different circumstances which affect their movements.

The following table displays the results for 1891-1901 and 1901-11; there have been some changes in boundaries, such as the extensions of Nottingham and Sheffield, the figures for the first period being given in accordance with boundaries as in 1891, but such changes rather tend to increase the apparent growth of the towns affected, and therefore do not in the least degree account for the losses shown:—

	Males.				Females.			
	1891-1901.		1901-11.		1891-1901.		1901-11.	
	Loss.	Gain.	Loss.	Gain.	Loss.	Gain.	Loss.	Gain.
10 Large towns	—	148,139	235,716	—	—	224,082	112,053	—
22 Textile fabrics manufact- uring towns	36,975	—	35,883	—	3,637	—	17,365	—
7 Industrial (Middlesbro, &c.)	—	8,390	—	15,050	—	5,715	—	6,369
6 Do. (Wolverhampton, &c.)	28,695	—	45,750	—	29,822	—	42,464	—
12 Do. (Southampton, &c.)	—	9,379	128	—	—	8,986	—	209
9 Colliery districts	—	46,210	—	75,153	—	38,948	—	40,125
19 Old towns	5,994	—	3,954	—	—	5,619	3,937	—
4 Military towns	—	22,125	—	9,965	—	16,503	—	1,801
12 Do. districts	—	24,227	4,119	—	—	9,664	—	331
7 Residential (with lunatic asylums)	—	15,972	—	15,039	—	19,550	—	21,205
9 Do. (Brighton, &c.)	—	21,271	—	2,504	—	40,761	—	21,539
3 Do. (Special)	—	2,228	—	8,980	—	9,757	—	14,514
13 Do. (Other)	—	7,514	—	21,035	—	23,387	—	35,374
3 Miscellaneous	—	971	—	3,697	—	1,705	—	3,448
136 Totals	—	234,762	174,127	—	—	371,218	30,704	—
24 Rural residues	351,695	—	138,853	—	308,745	—	163,102	—
160 England and Wales	116,933	—	312,980	—	—	62,473	193,806	—

The actual gains and losses (net) in the 136 districts (or groups of districts) are set out in the appended table.

The case of London is apparently of great moment. If we go into detail, we have

	Males.			Females.		
	1881-91.	1891-01.	1901-11.	1881-91.	1891-01.	1901-11.
Births	877,876	936,276	979,526	847,335	902,898	942,244
Deaths	517,722	567,381	523,625	494,552	539,879	494,869
Natural increase	360,154	368,895	455,901	352,783	363,019	447,375
Migrations (plus or minus)}	+ 58,886	+ 86,833	- 158,432	+ 110,059	+ 139,643	- 76,665
Actual increase	419,040	455,728	297,469	462,842	502,662	370,710

Here, it will be noted, we have an increase of births (though at a diminished rate) and an important decrease in the number of deaths, yet all is upset by the alteration in the current of migrations.

It is true that, by reason of the increased facility of travel, many places quite beyond the area of London as a town now serve as dormitories for some of those who gain their living by working in London. Here is a list of some important districts which might come within that category :—

Districts.	Population (males).		Gain by migration.	Population (females).		Gain by migration.
	1901.	1911.		1901.	1911.	
Southend	24,661	42,988	14,336	26,509	50,817	20,010
Reigate	19,843	22,969	746	22,897	26,728	1,524
Godstone	13,946	16,251	1,360	13,918	17,907	3,015
Uxbridge	18,738	29,359	7,752	20,265	31,371	7,962
Staines	16,884	18,663	- 770	16,977	19,760	+ 35
Watford and St. Albans	41,092	54,255	7,914	45,852	61,494	10,764
Brentwood	10,916	14,103	3,360	11,490	14,375	2,652
Guildford	30,372	35,135	1,415	31,750	37,587	2,709
Herne Bay	9,698	10,592	- 36	11,168	12,767	+ 682

Counting in, besides these, such places as Brighton, Eastbourne, and the Isle of Thanet, we cannot account for more than 50,000 males to be deducted from the loss shown of 158,432, and we must assume that, instead of a gain of some 80,000 men of full age, we are now confronted with a loss of about equal amount. And this is arrived at after the return of the volunteers from South Africa, and after receiving an unusual number of aliens from the Continent of Europe.

That some increase in the numbers of children will be shown is to be expected, because of the increase in births and decrease

in deaths; but children are rather a burden than otherwise, and cannot make up for the loss of earning-power which these figures imply. And the process of depletion is apparently going on faster than ever, so that our water authority may well find a lessened tendency towards the increase of its rental, and an increased probability of having to fall back upon the ratepayers for deficiencies.

Turning to the remaining 135 towns and districts, the Census reveals a real attraction in 36 instances only, if we disregard the additions to population in the 9 places tabulated above as being influenced by the metropolis. These 36 places are

	Gain.			Gain.	
	Males.	Females.		Males.	Females.
*Manchester.....	1,455	3,804	*Barnsley colliery } district	7,705	2,271
*Hull	1,765	2,293	*Nuneaton colliery } district	4,747	3,706
Oldham	1,791	1,250	*Coventry.....	14,503	10,173
Stockport	4,346	6,581	Lincoln	3,104	1,292
Rochdale	950	1,264	*Ipswich	935	887
Burnley	2,612	3,272	Exeter.....	522	1,837
Huddersfield	4,594	5,455	*Portsmouth	14,026	7,610
*Rotherham	4,241	1,787	*Aldershot†	3,230	1,354
*Doncaster	13,313	8,883	Blackpool	5,504	10,431
*Middlesbro'	4,543	1,105	*Harrogate	213	2,535
*Southampton	4,066	3,630	Llandudno	1,295	3,053
*Grimsby	5,684	3,958	Brighton.....	1,079	3,870
*Swindon	2,014	3,062	*Eastbourne.....	1,628	4,130
*Rugby	1,052	1,253	Worthing	1,893	4,496
Stafford	1,065	713	Bournemouth.....	6,317	10,729
*Luton	4,791	4,433	*Poole	3,048	4,902
*South Wales col- } liery district	81,899	49,404	Torquay, &c.	2,770	2,360
*Notts and Derby } colliery district }	13,990	12,899	*Clacton, &c.	2,046	796

* Natural increase fully 11 per cent. on commencing population.

† Farnham and Hartley Wintney districts.

The places are marked where an average addition was made by births in excess of deaths, as well as the gain by migration shown.

At Stafford there were in 1901 to 1910 1,341 deaths of lunatics, so that most of the immigrants in the decennium seem to have come to fill vacancies in the asylums. Lincoln showed in 1901 to 1910 1,224 deaths of lunatics, and in Exeter there were 1,623 similar deaths, excluding patients in a local asylum. Consequently, some deduction must be made for such deaths if we wish to know the real addition of useful citizens in those places. The other places with less than 11 per cent. of gain by excess of births are all either textile manufacturing or residential places, in which classes the greatest fall in birthrates has been experienced, and the greatest need of reinforcements from elsewhere may be felt.

Turning to losses by migrations, we have the following facts as to some of the larger cities:—

	Wellingboro'.		Kettering.		Northampton.		Carlisle.	
	Males.	Fe- males.	Males.	Fe- males.	Males.	Fe- males.	Males.	Fe- males.
1891-1900.								
Gain by natural increase	4,399	4,403	3,695	3,925	5,118	5,605	2,990	2,712
Add gain by migrations	1,842	1,745	1,754	2,461	889*	285	469	1,505
Gain	6,241	6,148	5,449	6,386	4,229	5,890	3,459	4,217
1901-10.								
Gain by natural increase	3,922	3,862	3,468	3,644	3,472	3,718	2,354	2,486
Less loss by migrations	3,557	2,476	1,903	1,927	2,476	2,040	1,964	1,581
Gain	365	1,386	1,565	1,717	996	1,678	390	905

* Loss.

Even in prosperous Burnley the gain by migrations has declined, as well as the "natural increase."

On the whole, these figures do not make very pleasant reading. If we divide the whole country into districts showing clear gains, including Southend and other places influenced by London (merging, however, the growing suburbs with the centres of towns, where population may decrease) and the remaining districts, we have

	Gaining districts.		The rest.	
	Males.	Females.	Males.	Females.
1901-10.				
Gain by natural increase.....	462,418	471,493	1,567,557	1,547,967
Less loss by migrations	267,835*	244,061*	580,815	437,867
Net gain	730,253	715,554	986,742	1,110,100

* Gain.

As the gaining districts had in 1911 only
 a population of 8,138,325
 and that of the remainder came to 27,932,167

Total 36,070,492

it looks as if less than a quarter of the English nation is attracting new citizens, and the remainder cannot dispense with emigration.

Further explanations seem desirable as to the rural districts in which smaller losses or even clear gains have been recorded in comparison with past experiences.

Extensions of collieries and ironworks have led to the following gains by migration in two registration districts in Carmarthenshire :—

	Males.	Females.		Males.	Females.
Llanelly gain	4,952	1,932	Llandilofaur gain	3,442	1,932

and in single parishes or small groups there have been increases of population due to a like cause as shown in the following list :—

	Population.	
	1901.	1911.
Llanarthney (Carmarthen)	2,134	3,022
West Saltney (Hawarden) ..	1,515	4,305
Connah's Quay (Flint).....	3,396	4,596
Cockfield (Teesdale)	1,833	2,672
Allerton Bywater (Tadcaster)	3,516	4,668
Thorne (West Yorkshire)	3,818	5,290
Balderton (Newark)	2,203	2,824
Ashby, &c. (Glanford Brigg, Lines)	3,578	8,310
Wilnecote, &c. (Tamworth).....	6,074	8,027
Ibstock, &c. (Market Bosworth).....	4,553	6,365
Asfordby (Melton Mowbray)	1,062	1,336
Polesworth, &c. (Atherstone)	6,476	8,172
Highley (Cleobury Mortimer).....	804	1,489
Midsomer Norton (Somerset) ..	5,809	7,299
Camerton (Somerset)	1,772	2,386

Manufacturing industries have been developed in few new places, viz. :—

	Population.	
	1901.	1911.
Cotton weaving—		
Barnoldswick (Skipton) ..	6,382	9,703
Earby (Skipton)	4,120	6,032
Woollen manufacture and shoemaking—		
Melton Mowbray	7,454	9,202
Brick-making—		
Linchmere (Midhurst)	392	924
Paper-making—		
King's Langley (Herts) ..	1,579	2,166

New military establishments have been created as follows :—

	Officers and men.
Bordon Barracks (Alton)	3,740
South Tidworth Barracks (Andover)	3,463
North Tidworth Barracks (Pewsey, Wilts).....	810
Longmoor Barracks (Petersfield)	1,128

A new County lunatic asylum has been opened at Hellingly (Hailsham) containing, in 1911, 495 male and 615 female inmates, and another at North Bromsgrove containing 241 males and 282 females.

The construction of the new Derwent Valley waterworks accounts for increases of population as follows in Derbyshire :—

	Population.	
	1901.	1911.
Tideswell and Chapel-en-le-Frith sub-districts	19,451	23,861
Hayfield parsh	2,614	3,459

The City of Bradford waterworks occasioned a like increase, viz. :—

Upper Stonebeck (Pateley Bridge)	284	830
--	-----	-----

and the new Leeds Corporation waterworks account for this further increase :—

Healey-with-Sutton (Leyburn)	166	1,083
------------------------------------	-----	-------

Although the wide boundary assigned to Grimsby in my book includes the site of the new docks at Immingham (which therefore do not affect the “rural residue” of Lincolnshire), it may be noted that their construction led to the following increases :—

	Population.	
	1901.	1911.
Immingham	241	2,681
Little Coates	83	1,866
South Killingholme	540	1,021

The erection of the “Garden City” of Letchworth caused the parish of the same name in the registration district of Hitchin to advance in population from 277 to 5,324.

The development of allotments and market gardens affected the following places, viz. :—

	Population.	
	1901.	1911.
Bengeworth (Evesham)	1,748	2,872
Hampton (do.)	977	1,314
Badsey (do.)	775	1,127
Eastergate (West Sussex)	216	606
Black Bourton (Witney)	197	577

The new harbour at Goodwick caused increases as follows :—

Fishguard	1,739	2,892
Llanwnda	1,110	2,612

The accidental presence of a number of fishing vessels at Padstow added 712 persons to the population of that quiet little place, and that of one of His Majesty's ships at Lyme Regis added 473 persons to the local population.

The transfer of railway engine works to Bishopstoke, near Southampton, occasioned great part of the increase at the following places as well as at Eastleigh :—

	Population.	
	1901.	1911.
Bishopstoke	1,538	2,191
Twyford	1,479	2,048
Chandler's Ford	1,085	1,641
	4,102	5,880

The extension of certain towns led to the following increases :—

	Population.	
	1901.	1911.
Cambridge: Chesterton	9,354	11,330
Cherry Hinton	2,720	4,455
	12,074	15,785
Reading: Caversham	6,498	9,785
Shinfield (Wokingham)	1,587	2,372
	8,085	12,157
Warrington: Grappenhall (Runcorn)	987	1,803
Lateford Without (Runcorn)	295	755
Stockton Heath (do.)	2,543	4,370
Walton Inferior (do.)	719	1,068
	4,544	7,996

and I think we must credit York with a growth of population in Acomb (Great Ouseburn).

The advance of several small watering places and health resorts may be shown as follows in the order of their latest populations :—

	Population.			Population.	
	1901.	1911.		1901.	1911.
Bognor	6,180	8,142	Hornsea	2,381	3,024
Sidmouth	4,201	5,612	Bude, with Stratton	2,308	2,976
Swanage	3,408	4,689	Llandrindod Wells	1,827	2,779
Newquay	3,115	4,415	Withernsea (E. York)	1,426	2,278
Skegness	2,140	3,775	Salcombe	1,710	2,032
Minehead	2,511	3,458	Church Stretton	816	1,455
Okehampton	2,569	3,174			

The improvement of railway facilities seems to have favoured the neighbourhood of Windsor; the actual gains by migration work out as follows:—

	Gains.	
	Males.	Females.
Amersham registration district (with } Chesham)	1,636	1,995
Eton registration district (with Slough)....	656	1,568

A few other residential localities have shown special progress, viz. :—

	Population.	
	1901.	1911.
Crowborough (Sussex)	3,639	5,148
Haslemere (Surrey)	2,614	3,520
Chiddingfold (Surrey)	1,548	2,175
Mellor (Derbyshire)	1,218	1,711

There remain a few towns outside the urban districts included in the 136 towns, &c., distinguished in my book, where progress has been made in the last ten years, viz. :—

	Population.			Population.	
	1901.	1911.		1901.	1911.
Prudhoe (Northumber- } land)	7,019	8,212	Stevenage	3,957	4,856
Hinderwell (N. York)	1,937	2,491	Chelmsford	15,572	18,008
Goole (W. York)	16,576	20,332	Hemel Hempstead	11,264	12,888
Gainsboro' (Lincoln)	17,660	20,587	East Grinstead	6,094	7,089
Scunthorpe (Lincoln)	6,750	10,170	Wokingham	3,551	4,352
Flint	4,625	5,472	Andover	6,509	7,596
Walsoken (near Wisbech)	3,250	3,898	Melksham	2,450	3,101
			Yeovil	11,155	13,759

These notices will serve to show that there have been many movements within the area of the "rural residues of counties" by which the lessened loss of population within their limits is, to some extent only, accounted for. The gains and losses on the whole may be thus shown :—

	Males.			Females.		
	1881-91.	1891-1901.	1901-11.	1881-91.	1891-1901.	1901-11.
Births	989,053	895,006	814,704	951,745	862,224	783,161
Deduct deaths	576,314	547,973	484,831	550,661	529,616	465,468
Natural increase	412,739	347,033	329,873	401,084	332,608	317,693
Loss by migrations	454,960	351,695	138,853	390,484	308,715	163,102
Final results	-42,221	-4,662	+191,020	+10,600	+23,863	+154,591

*Gains and losses by migration in 1901-11 in 136 districts or groups of districts in England and Wales.**

	Population, 1911.		Result of migrations.			
			Males.		Females.	
	Males.	Females.	Losses.	Gains.	Losses.	Gains.
London	3,438,290	3,876,230	158,432	—	76,665	—
Manchester.....	587,210	638,183	—	1,455	—	3,804
Hull.....	144,810	152,204	—	1,765	—	2,293
Liverpool.....	548,967	601,363	12,295	—	—	1,363
Birmingham.....	527,049	571,127	15,013	—	9,604	—
Leeds.....	224,134	247,226	17,272	—	12,456	—
Sheffield.....	233,449	239,300	10,625	—	7,863	—
Bristol.....	194,585	228,129	14,396	—	8,579	—
Leicester.....	135,895	153,949	7,100	—	3,685	—
Nottingham.....	120,401	139,503	3,773	—	661	—
	6,154,790	6,847,214	235,716	—	112,053	—
Oldham.....	112,893	122,688	—	1,791	—	1,250
Burnley.....	105,641	116,524	—	2,612	—	3,272
Huddersfield.....	88,239	100,186	—	4,594	—	5,455
Stockport.....	83,738	96,790	—	4,346	—	6,581
Rochdale.....	60,636	68,462	—	950	—	1,264
Bradford.....	170,320	197,968	6,987	—	2,743	—
Bolton.....	131,240	144,687	5,878	—	4,145	—
Blackburn.....	109,821	125,724	4,084	—	2,706	—
Halifax.....	87,132	101,857	9,036	—	6,980	—
Ashton-under-Lyne.....	85,771	95,933	3,725	—	3,427	—
Dewsbury.....	82,395	92,324	3,492	—	2,606	—
Preston.....	75,271	86,018	2,632	—	1,595	—
Bury (Lancs).....	69,977	79,377	2,713	—	2,328	—
Haslingden.....	55,104	61,478	3,439	—	3,053	—
Keighley.....	36,829	42,329	2,243	—	1,474	—
Macclesfield.....	27,985	32,807	893	—	591	—
Wharfedale†.....	28,644	33,084	168	—	—	1,272
Kidderminster.....	18,600	21,974	1,882	—	1,621	—
Todmorden.....	19,605	21,744	1,395	—	1,355	—
Leek.....	23,068	24,299	710	—	721	—
Glossop.....	11,725	13,972	644	—	794	—
Saddleworth.....	8,475	9,179	255	—	320	—
22 towns.....	1,493,109	1,689,404	35,883	—	17,365	—
Middlesbro'.....	113,142	107,196	—	4,543	—	1,105
Rotherham.....	73,736	67,676	—	4,241	—	1,787
Doncaster.....	63,475	58,037	—	13,313	—	8,883
Swindon.....	33,231	32,659	—	2,014	—	3,062
Tilbury (Orsett).....	21,921	18,949	—	512	—	75
Walsall.....	63,422	64,213	6,167	—	6,190	—
Crewe (Nantwich).....	38,797	38,973	3,406	—	2,353	—
7 towns.....	407,724	387,703	—	15,050	—	6,369

* I do not add the calculated gain per cent. in each case, as I think, where boundaries are wide, more than the whole gain shown is often due to the central town, and in the outer parishes there may be losses.

† The lunatic asylum here attracted many persons from outside places.

Gains and losses by migration in districts or groups of districts—Contd.

	Population, 1911.		Result of migrations.			
			Males.		Females.	
	Males.	Females.	Losses.	Gains.	Losses.	Gains.
Wolverhampton group.....	218,574	222,060	22,423	—	21,080	—
Potteries	159,184	163,622	10,588	—	10,318	—
Cockermouth	33,817	34,530	5,381	—	5,354	—
Barrow-in-Furness	33,374	30,396	2,871	—	781	—
Whitehaven	29,019	28,998	2,305	—	3,172	—
Millom (Bootle).....	6,704	6,873	2,182	—	1,759	—
6 places	480,672	486,479	45,750	—	42,464	—
Southampton	83,106	86,267	—	4,066	—	3,630
Grimsby	61,078	61,069	—	5,684	—	3,958
Luton	31,951	35,558	—	4,791	—	4,433
Rugby	20,624	20,829	—	1,052	—	1,253
Stafford*	17,539	17,621	—	1,065	—	713
Burton-on-Trent	46,767	45,393	6,706	—	6,319	—
Wellingborough.....	28,392	29,401	3,557	—	2,476	—
Kettering	25,437	25,938	1,903	—	1,927	—
Penzance	22,401	27,501	2,169	—	747	—
Redruth	21,425	27,462	1,589	—	1,088	—
Falmouth†	11,222	13,011	—	154	343	—
Helston	9,189	10,940	1,016	—	878	—
12 places	379,131	400,990	128	—	—	209
Glamorgan group	791,285	727,055	—	81,899	—	49,404
Chesterfield „	297,044	286,340	—	13,990	—	12,899
Barnsley „	170,126	154,255	—	7,705	—	2,271
Nuneaton	32,852	31,562	—	4,747	—	3,706
Durham group	966,420	955,151	14,694	—	8,699	—
Wigan „	330,303	326,061	14,914	—	15,011	—
Wrexham	40,903	38,151	1,264	—	1,474	—
Cannock	28,862	25,750	1,050	—	1,791	—
Ashby de la Zouch	26,071	24,381	1,266	—	1,180	—
9 districts	2,683,866	2,568,706	—	75,153	—	40,125
Coventry	54,557	52,374	—	14,503	—	10,173
Ipswich	49,506	54,029	—	935	—	887
Exeter	45,687	54,560	—	522	—	1,837
Lincoln	42,816	42,774	—	3,104	—	1,292
Oxford	30,412	36,718	—	60	—	901
Maidstone‡	25,073	26,800	—	33	40	—
Norwich	67,318	77,126	2,453	—	2,334	—
Wakefield	64,083	61,763	538	—	1,573	—
Derby	60,380	63,900	3,244	—	2,732	—
York	48,354	50,360	2,238	—	1,685	—
Yarmouth and Lowestoft....	48,076	56,279	1,976	—	499	—

* The lunatic asylum here attracted many persons from outside places.

† Persons on board vessels and military, 497 in 1901, were 983 in 1911.

‡ This place would have shown losses of both sexes but for its county asylum.

Gains and losses by migration in districts or groups of districts—Contd.

	Population, 1911.		Result of migrations.			
			Males.		Females.	
	Males.	Females.	Losses.	Gains.	Losses.	Gains.
Northampton	43,920	48,109	2,476	—	2,040	—
Chester	35,232	38,076	1,202	—	1,260	—
Reading	36,199	38,999	3,176	—	2,394	—
Carlisle	30,049	34,107	1,964	—	1,581	—
Gloucester	29,623	33,027	1,259	—	241	—
Worcester	22,929	26,512	1,215	—	1,269	—
Cambridge	18,010	22,017	270	—	409	—
King's Lynn	10,276	10,860	1,100	—	970	—
19 old towns	762,530	828,390	3,954	—	3,937	—
Portsmouth	151,313	150,676	—	14,026	—	7,610
Colchester	22,403	21,019	—	708	—	60
Plymouth	114,972	115,650	2,882	—	4,134	—
Chatham	81,123	74,301	1,887	—	1,735	—
4 towns	369,811	361,676	—	9,965	—	1,801
Farnham (Aldershot)	43,073	33,400	—	2,346	—	561
Aldershot, North*	19,503	16,619	—	884	—	793
Weymouth (Portland)†	26,724	21,009	—	983	579	—
Salisbury and Amesbury‡	21,283	21,270	—	385	—	180
Godstone (Caterham)	16,251	17,907	—	1,360	—	3,015
Folkestone (Shorncliffe)§	26,519	30,755	1,157	—	—	774
Dover	26,470	25,474	1,326	—	1,721	—
Windsor	19,381	21,221	1,998	—	1,419	—
Deal (Eastry)	16,149	16,694	800	—	593	—
Sheerness (Sheppey)	13,730	10,652	786	—	6	—
St. Germans	10,259	10,426	2,331	—	213	—
Canterbury	11,718	12,908	1,679	—	461	—
12 districts	251,060	238,335	4,119	—	—	331
Watford	54,255	61,494	—	7,914	—	10,764
Uxbridge	29,359	31,371	—	7,752	—	7,962
Guildford	35,135	37,587	—	1,415	—	2,709
Rhyl (St. Asaph)	15,315	17,911	—	302	—	1,065
Morecambe (Lancaster)	32,722	36,395	1,941	—	767	—
Leamington (Warwick)	25,491	31,267	26	—	225	—
Malvern (Upton-on-Severn)	13,130	16,489	377	—	303	—
7 places with asylums....	205,407	232,514	—	15,039	—	21,205

* Hartley Wintney district.

† Soldiers and sailors of Royal Navy were 5,110 in 1901, but 6,993 in 1911.

‡ With Bulford camp.

§ Elham district.

Gains and losses by migration in districts or groups of districts—Contd.

	Population, 1911.		Result of migrations.			
			Males.		Females.	
	Males.	Females.	Losses.	Gains.	Losses.	Gains.
Brighton	87,684	113,920	—	1,079	—	3,870
Blackpool (Fylde).....	53,042	65,212	—	5,504	—	10,431
Thanet	34,799	43,747	—	2,216	—	3,947
Harrogate (Knaresboro')	20,259	26,902	—	213	—	2,535
Llandudno (Conway)	18,121	23,133	—	1,295	—	3,653
Southport (Ormskirk)	52,250	65,487	434	—	—	1,701
Hastings	36,676	51,127	4,113	—	2,074	—
Bath	35,217	46,364	1,020	—	128	—
Scarborough	22,243	28,390	2,236	—	1,796	—
9 places	360,291	464,282	—	2,504	—	21,539
Bournemouth(Christchurch)	36,114	54,247	—	6,317	—	10,729
Isle of Wight*	41,399	46,787	—	770	711	—
Worthing (East Preston)....	20,679	27,672	—	1,893	—	4,496
3 places	98,192	128,706	—	8,980	—	14,514
Southend (Rochford)	42,988	50,817	—	14,336	—	20,010
Torquay, &c.	60,023	72,825	—	2,770	—	2,360
Bedford	29,328	33,463	—	233	111	—
Clacton and Harwich †.....	27,374	26,067	—	2,046	—	796
Eastbourne.....	26,038	35,534	—	1,628	—	4,130
Reigate	22,969	26,728	—	746	—	1,524
Poole	20,795	24,395	—	3,048	—	4,902
Tunbridge	32,141	39,662	977	—	—	453
Cheltenham	24,562	34,129	1,641	—	759	—
Weston-super-Mare‡.....	22,764	29,825	16	—	—	1,703
Staines.....	18,663	19,760	770	—	—	35
Herne Bay (Blean)	10,592	12,767	36	—	—	682
Cromer (Erpingham)	11,868	12,718	332	—	151	—
13 districts	350,105	418,690	—	21,035	—	35,574
Brentwood (Billericay).....	14,103	14,375	—	3,360	—	2,652
Maidenhead	13,132	14,398	—	345	—	678
Easthampstead§.....	9,013	8,535	8	—	—	118
3 districts	36,248	37,308	—	3,697	—	3,448

* Military and naval men were 735 in number in 1901, but 1,264 in 1911, besides 409 cadets in the Royal Naval College.

† Tendring district.

‡ Axbridge district.

§ Sandhurst, and Broadmoor criminal lunatic asylum, are in this district.

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*Final Report on the First Census of Production of the United Kingdom* (1907). viii + 938 pp. [Cd-6320.] 1912. Price 7s. 6d.

Preliminary figures for the Census of Production of 1907 have been given in nine reports published in 1909-11. For the present volume the whole of the preliminary tables have been carefully revised and expanded and the reports re-written, and in addition information is now given as to the kind and capacity of engines (steam or internal combustion engines, water power or other power) and dynamos owned, and the quantity of electricity generated or purchased in each trade. An exceedingly interesting general report by the Director of the Census, Mr. Flux, is prefixed.

The following table summarises the principal information for England and Wales, Scotland and Ireland:—

	1	2	3	4	5	6	7
	Gross output. Selling value or value of work done.	Materials used. Cost.	Work given out. Amount paid to other firms.	Net output. Excess of col. 1 over cols. 2 and 3.	Persons employed (except out-workers). Average number.	Net output per person employed, excluding out-workers.	Horse-power of engines at factories, mines, &c.
	£ mil.	£ mil.	£ mil.	£ mil.	1,000's.	£	1,000's.
England and Wales	1,490	868	19	603	5,808	104	9,098
Scotland	208	117	5	86	885	98	1,398
Ireland	67	43	1	23	291	78	259
United Kingdom	1,765	1,028	25	712	6,985	102	10,755

This table includes those industries only which were dealt with

in the Census of Production office, and not the value of the agricultural output, concerning which separate investigations were made by the Board of Agriculture and the Department of Agriculture for Ireland. The "net output" of col. 4 is the value added to the materials by all processes of manufacture covered by the table: if to this is added the value of the materials utilised so far as they have been brought in from outside sources, we have the value of the output free from duplication. This calculation cannot be effected directly, for the value of such materials cannot be taken from the schedules. The formation of an estimate is, however, attempted by Mr. Flux. Separating the "primary food industries" which work up the products of agriculture and fisheries directly, the estimated value of the output is 199 millions, or deducting 15 millions of duties, 184 millions. Of all other industries the net output is 650 millions. To this must be added:—Value at place of production of raw materials of United Kingdom origin from trades not covered by the Census, 18·5 millions; value of imported raw and semi-manufactured materials, at the port of landing, 310·7 millions; estimated allowance for carriage and merchanting of the latter to bring them to the place of working up, 28 to 43 millions; estimated value of net output of workers coming within the scope of the Census but for whom returns were not secured, 50 millions. Total for all industries other than primary food industries, $650 + 18\cdot5 + 310\cdot7 + 28$ or $43 + 50 = 1,057$ to $1,072$ millions, or for *all* industries, $1,241$ to $1,256$ millions.

It remains to add to this the output of agriculture and fisheries, concerning which inquiries (without compulsory powers) were conducted by the Board of Agriculture in Great Britain and by the Department of Agriculture in Ireland. In the reports issued by the respective departments the value of agricultural produce of all kinds sold off the farms is estimated at 150·8 millions for Great Britain and 45·6 millions for Ireland, total 196·4. But some 7 millions must be deducted from this on account of cattle, &c., sold from Ireland to British farmers for fattening, leaving a remainder of 189·4 millions. Further a great part, but apparently not quite the whole, of the output of creameries and cheese factories, included in the returns received at the Census of Production office, is also included in the agricultural returns. It is more convenient to keep the whole (6·6 millions) in the latter, and a small amount must be added—about 300,000*l.*—for the balance not already included. Further a considerable amount must still be added on account of dairy produce and cider consumed by farmers' households, the output of holdings not exceeding one acre, poultry and eggs consumed by the families and all other items not covered by the reports. This is a large and serious addition, and the value can only be very conjecturally estimated at some 20 millions, making with the 190 millions previously reached a total of 210 millions for the agricultural output.

Finally for the output of fisheries we have as the value of the fresh fish and shell fish landed in the United Kingdom in 1907 11·7 millions.

Summarising, the total output of industry is estimated (deducting the output of creameries and cheese factories) at 1,234 to 1,249 millions, of agriculture about 210 millions, and of fisheries about 12, total about 1,456 to 1,471 millions. But although the value given for each group has been freed from duplication, there is still some duplication between the groups. Agriculture supplies some 40 millions worth of materials to industry, which is included in the value of the industrial products; fisheries supply some 2 millions worth of fish to the fish curing industries, again included in industrial products; and industry supplies some 29 millions worth of goods, manures and salt to agriculture and fisheries, the value of which is repeated in the value of agricultural produce and fish. Deducting 71 millions for these duplicated entries the final estimate for the value of the output of the United Kingdom is 1,385,000,000*l.* to 1,400,000,000*l.* This total represents the "factory value" or the value at the point where the mining, agricultural or other processes are completed. The value added by the handling of merchants, by carriage to the place of consumption, or by customs or excise duties is not included.

Some interesting tables are given comparing the output of industry in the United Kingdom with the exports of home produce and the net imports. These tables require a good many cautions as to interpretation, but it will perhaps be of interest to give the following figures for the three classes in which figures for output and foreign trade are most comparable:—

	Percentage of United Kingdom output.	
	Exports (1907).	Net imports (1907).
	Per cent.	Per cent.
1. Food, drink, fodder, seeds, plants, flowers and tobacco (natural and manufactured products, less duplicated items)	5	60
2. Raw materials of industry	29	128
3. Finished products of industry	25	7

The goods in the third class described as "finished" correspond to those classed as "finished" in the summaries of returns of output; the classification is not that of the Trade Returns. Of the goods in Class 1 it will be seen that the net imports amount to 60 per cent. of our output, or over one-third of the total retained. Over 30 per cent. of the imports of such food products consist of materials to be further worked up in the United Kingdom. In the case of raw materials of industry the net imports are greater by over one-fourth than the native output or form some 56 per cent. of the raw materials utilised in the United Kingdom. The "raw materials" exported consisted in 1907 almost wholly of coal, which formed 92 per cent. of the total value. Imports of "finished products" in the above sense form only 7 per cent. of the output of the United Kingdom itself.

The portion of the Introductory Report from which we have been citing contains, as the reader will have noted, a good many estimates of greater or less reliability, to which the director was compelled to resort when definite data for building up the final total for the output of the United Kingdom were lacking. This feature of the report becomes even more marked in the final section in which Mr. Flux, trespassing somewhat outside the strict limits of a Census of Production, endeavours by very interesting and ingenious methods to estimate the total income of the United Kingdom. The ultimate result at which he arrives is that the income lies somewhere between 1,900 and 2,150 millions, an estimate which, it is noted, is in fair accordance with recent estimates by Mr. Bowley and the *Statist*. While no one of the estimates then may inspire us with very great confidence, the fact of their consensus—made as they are by sufficiently distinct methods—suggests that they are probably somewhere in the neighbourhood of the truth—as in the case of the estimates of population in the eighteenth century dealt with elsewhere in this issue of the *Journal*.

The report is so interesting that we are glad to know that it will be separately issued, so that the student can obtain it at a moderate price, the present somewhat bulky volume being reissued in parts. It might be worth considering on another occasion whether the agricultural reports could not be included in the issue, so that the purchaser would have all the official material on which the general report was based.

There is a very full and excellent index to the volume, the only inconvenience we have noted in using it being due to the omission of the sectional headings. This has rather curious results, which are somewhat bewildering to the reader, who can hardly be expected to know the sectional headings by heart. Thus, "Food, drink and tobacco trades" does not occur in the index; "metal trades, other than iron or steel," does; "textile trades" does not; "clothing trades" does. It would seem to be more convenient to include the sectional headings in another issue.

The Director and the Staff are to be heartily congratulated on the completion of the first Census of Production and the issue of the Final Report. It is announced that schedules for the second census will be issued early in the present year. G.U.Y.

2.—*Lamb's friend the census-taker: life and letters of John Rickman*. By Orlo Williams. xvi + 330 pp., 8vo. London: Constable and Co., 1912. Price 10s. 6d. net.

The publication in this number of the *Journal* of Professor Gonner's able exposition of the gropings of various eighteenth century writers towards estimates of the population of this country at different periods affords an appropriate opportunity of noticing the work of a now almost-forgotten statistician who, though he came somewhat later on the scene, contributed very importantly to an elucidation of the real position.

It is hardly too much to claim for John Rickman that he was the inspirer, as well as the organiser, of the first English census.

Born at Newburn, in Northumberland, on August 22, 1771, and educated at Guildford Grammar School and Lincoln College, Oxford, he does not at first seem to have done much after taking his degree beyond engaging in "literary pursuits" and writing about economic subjects. In 1796, when he was 25 years old, and was living at Burton, near Christchurch, Hants, he compiled a paper entitled "Thoughts on the utility and facility of a general enumeration of the people of the British Empire," which attracted the attention of the local Member of Parliament, Mr. (afterwards Sir George) Rose. In this paper he expressed the belief that "the real number of inhabitants in England is far beyond the usual estimate," and asked "Can we then avoid thinking that an accurate statement of population would be a most consoling consideration to every lover of his country?"

A copy of this paper was communicated by Rose to Charles Abbot (afterwards Lord Colechester), who was already making a name for himself in the House of Commons. Abbot introduced in 1800 a Population Bill which passed both Houses, and which authorised the taking of the first census.¹ When it had become an Act, Rickman was offered the supervision of the Returns to be made under it. He was already a friend and correspondent of the poet Southey, and in a letter to the latter dated December 27, 1800 (printed—apparently for the first time—in Mr. Orlo Williams' book), Rickman makes this extraordinary comment on his appointment:—

"At my suggestion, they have passed an Act of Parliament for ascertaining the population of Great Britain, and as a compliment (of course) have proposed to me to superintend the execution of it. Next March the returns will be made, and I shall be busy enough for a short time, I suppose. I suspect all this attention (it is more immediately from G. Rose) is intended as a decent bribe: which I shall reject, by doing the business well and taking no more remuneration than I judge exactly adequate to the trouble." (P. 38.)

This suspicion appears to have been entirely unfounded. Soon after Abbot was appointed, in February, 1801, Chief Secretary to the Lord Lieutenant of Ireland, Rickman followed him to Dublin as his private secretary, and they spent some time in Ireland together. In February, 1802, Abbot was recalled to London to take up the post of Speaker of the House of Commons, and Rickman came back with him. He remained Speaker's Secretary until July, 1814, when (his old patron Abbot being still in the Chair) Rickman was made Second Clerk Assistant at the Table of the House of Commons, with a salary of 1,500*l.* He was promoted in 1820 to be Clerk Assistant, with a salary of 2,500*l.*, and in that position he remained until his

¹ See the Preliminary Report of the Census Commissioners for 1881 [C. 2955] for the story of an earlier Bill "for taking and registering an annual account of the total number of the people," introduced by Mr. Thomas Potter, M.P. for St. Germans, on March 30, 1753, which passed the Commons but was thrown out by the Lords, and for particulars of Mr. Abbot's Population Bill of 1800. Much of this information is reproduced in Dr. Longstaff's paper read before the Society on June 25, 1889. (Vol. lxii, pp. 437-9.)

death, from an ulcerated larynx, on August 11, 1840, the last day of the Parliamentary Session of that year. He may be said, therefore, to have been comfortably provided for from the time that the future Speaker gave him his first appointment, and he seems to have abundantly justified the confidence placed in him by an earnest and faithful discharge of his manifold duties.

Mr. Orlo Williams does not explain in any detail Rickman's work upon the census. Material more attractive to the readers of his book is to be found in the letters exchanged by Rickman with his literary friends, Charles Lamb, Samuel Coleridge, Robert Southey, Sharon Turner, Thomas Telford, and many lesser lights. It is incidentally mentioned, however, that the original Census office was in "the Cockpit," off Birdcage Walk (p. 40), that Rickman was empowered to choose his own clerks, and that one of those to whom he gave a job was the scapegrace George Burnett (pp. 46, 58), of whom at last he had to get rid (p. 64). Rickman complains in a letter to Southey, dated July 13, 1801, of "the incredible inaccuracy of the returns under the Population Act. I write hundreds of letters to little purpose, and have worked about nine weeks without being able to say that anything is done" (p. 46). His appointment, however, as Abbot's secretary, announced to Southey in this letter, gave him some little diversion, and we hear nothing more of any difficulties about the completion of the Returns.

Rickman was employed again as supervisor of the Census for 1811, 1821, and 1831, and at each period he made improvements in the form and presentation of the returns. According to his son, W. C. Rickman, who wrote a Memoir of him in March, 1841, of which a copy was presented at the time to this Society's library, John Rickman only received a remuneration of 500 guineas for each Census on the average, which, considering the immense amount of work he put into them, does not seem over liberal. He interested himself deeply in all questions affecting the population and progress of the country, and amongst other investigations he made was one of particular interest from the point of view of Professor Gonner's paper.

This was an inquiry into the probable population of England and Wales at various dates in the past, and it was a private investigation set on foot by Rickman of his own motion—with official sanction, it is true, but not on official instructions. One of the volumes of the 1831 Census, entitled "Parish Register Extract," had given the number of baptisms, burials and marriages for each of the years 1821 to 1830, under each hundred of each county, with elaborate notes of the earliest dates to which the register books of each parish extended. Rickman felt this information to be of such value and importance that the full abstracts of the answers, exceeding 14,000 in number, given by the clergy as to their parish registers (the number of such volumes, their dates, and their state of preservation), together with nearly 4,000 original letters from clergymen and others in explanation thereof, were deposited by him at the British Museum in two very large volumes, labelled "Parish Registers Extract, 1831." He then conceived the idea of getting the clergy

to extract particulars from these old registers, which would enable some sort of reliable estimate to be made as to the population at different periods in the past; and on April 16, 1836, he wrote to the Home Office asking permission to address the clergy with this object. Beyond requesting that the letters of inquiry might be forwarded from the Home Office, and that the circular letters and return covers might be furnished by the King's printers, he did not ask for any official aid, "as the further expense will not be considerable, and I shall be well satisfied with the pleasure of producing pregnant proof of superior national respectability, similar to that which in private families renders ancestry a personal gratification and at the same time an incentive to honourable conduct." The necessary assent was given by Lord John Russell, then Home Secretary, on September 22, 1836, and in October, 1836, Rickman issued his circular letter to the clergy, asking them, with many a rhetorical flourish, to be good enough to co-operate with him by extracting from their registers, where such existed, the number of baptisms, burials and marriages in the years 1570, 1600, 1630, 1670, 1700, and 1750. He explained why the earlier of these dates were chosen and his "motives for undertaking the voluntary labour of collecting and hereafter arranging such of the Returns solicited by this circular letter as the clergy may be so good as to afford on this occasion."

Before his death, Rickman had completed in tabular form his estimates of the population of the several counties at the periods above indicated, "calculated on the supposition that the registered baptisms, burials and marriages in those years bore the same proportion to the actual population as in the year 1831," and in a letter to Sir Henry Parnell of March 21, 1840, he wrote, "so that I am in possession of documents whereby the population from the reign of Elizabeth may be inferred with sufficient approximation for insertion in the preface of the future population volume for 1841, and thus the superiority of England in this as well as in all other national records will be applied to the increase of useful knowledge."

Rickman fell ill on June 2, 1840, the day after the Population Bill authorising the taking of the Census of 1841 had been brought in. His death in the following August prevented the preparations for the forthcoming Census from having the benefit of his further assistance; and the Census Commissioners of 1841 contented themselves with printing on pages 34-7 of their Enumeration Abstract the figures prepared by Rickman, with a statement that "there is reason for supposing the estimate hereby arrived at to be an approximation to the truth." The figures for the individual counties in 1700, 1750 and 1801 are given in the table appended to Professor Gonner's paper on page 295; but it may be interesting to give in summary Rickman's figures for the whole of England and Wales for each of the dates he selected for his retrospective census.

Population in	England.	Wales.	Total.
1570 (estimated)	3,737,841	422,479	4,160,121
1600 " 	4,460,454	351,264	4,811,718
'30 " 	5,225,263	375,254	5,600,517
'70 " 	5,395,185	378,461	5,773,646
1700 " 	5,653,061	391,947	6,045,008
'50 " 	6,066,041	450,994	6,517,035
1801 (enumerated)	8,331,434	541,546	8,872,980
'11 " 	9,538,827	611,788	10,150,615
'21 " 	11,261,437	717,438	11,978,875
'31 " 	13,091,005	806,182	13,897,187

Charles Lamb often speaks in his letters of the pleasure that Rickman's society and conversation gave him, but a more reliable opinion of Rickman's qualities as an official and investigator is contained in a letter written by Sharon Turner on September 20, 1840. "He had a strong and resolute mind, very discursive, full of varied but promiscuous knowledge, ready to bring it out whenever called upon . . . Whatever he directed attention to, he pursued with a zeal and perseverance and with an almost insensibility to fatigue that can be seldom paralleled . . . His public fame will rest mainly and soundly on his labours, efficiency and arrangement of our Population Census. His publications on this subject deserve the highest commendations for the labour, discrimination, force of mind, patience of examination, sound judgment, and varied knowledge which they display. They seem to contain the substance of all that is most necessary to be known on this great and interesting subject."

E.C.

3.—*Sociologie und Statistik*. Von Dr. Franz Žižek, Privatdozent an der Universität Wien. 47 pp., 8vo. München und Leipzig: von Duncker und Humblot, 1912. Price 1.50 m.

This brochure is a careful and well-written enquiry into the relations between sociology and statistics. The author laments the partial estrangement between these allied sciences, traces its causes, and summarizes the methods of the best-known writers who have used statistics in sociological investigations. He shows that on the one hand sociology must draw its inferences from non-statistical data, both when dealing with the past and in qualitative work, and on the other that statistics must furnish information for administrative and other practical purposes which do not interest the sociologist. But statistics have been and should be in an increasing measure inspired by the achievements and lines of investigation of sociology, which in turn is continually depending for modern and measurable natural and racial relations on statistical methods and results. Thus each science has its sphere of work, but these spheres have in considerable measure a common content.

The help given by statistics is analysed under the four headings: Struktur der Gesellschaft (division of function, distribution of income, family economy, societies and unions, &c.); Stabilität der

gesellschaftlichen Zustände und Erscheinungen (birth, marriage and death rates, real wages, &c., with their approximate constancy in separate countries, and their variation in locality and time); Kausalen Beziehungen (the interdependence and correlation between most of the measurable phenomena of industrial and cultural society); Rassenbiologie und Rassenhygiene (anthropometry, heredity, &c.). From the analysis it appears that the great bulk of statistical results is of more or less direct use to the sociologist.

We regret that the author has not laid explicit stress on the importance of mathematical statistical measurements to sociologists, who have been in some cases regrettably weak in their quantitative arguments. The less certain and general the measurement the more must reference be made to the theory of probability. The more subtle measurements of correlation are specially applicable to difficult problems of causation. The whole body of work on curves of frequency and standard deviations is of direct use in dealing with questions of relations between and descent of races, as soon as anthropometrical measurements have been made. A.L.B.

4.—*Variabilità e Mutabilità*. Contributo allo studio delle distribuzioni e delle relazioni statistiche. By Professor Corrado Gini. 158 pp., Svo. Bologna, 1912.

In this book Professor Gini deals with the various indices by which the range of variation of different types of distributions can be indicated. We can only briefly touch upon the methods by which these indices are reached. The arithmetical mean and the median are taken as fundamental origins in the distribution, and four indices are formed by finding (a) the mean of the deviations of the frequencies without regard to sign from each of these origins, and (b) the corresponding root mean square deviations. Other criteria of variation are obtained by forming certain functions of all the possible differences of the values of the variable which occur, and by a little mathematical reduction these can be put into fairly simple forms.

Professor Gini's definitions confine the use of the word "variability" to quantitative distributions; "mutability" being used for distributions qualitatively classified. As examples of the former he discusses the prices of different classes of meat and the cephalic index of Italian soldiers. The chief examples of "mutability" are those of human hair colour and eye colour—which must necessarily be classified qualitatively—and he attempts to rank the provinces of Italy in order of their range of variation of these characters. We cannot help thinking that the distinction between the two cases is unnecessary, since the same phenomenon is being described in each case, and the examples employed readily permit the undesirability of the distinction to be made evident. The qualitative arrangements in the examples of hair colour and eye colour are solely matters of convenience and due to our inability to measure readily the corresponding amounts of pigment. Underlying the qualitative classification which we are forced to

make we can quite readily conceive of a quantitative scale, and advancing knowledge may render such a scale possible.

In any case, however, we think that Professor Gini's method of measuring "mutability," say, of hair colour in a population is open to considerable criticism, since it is practically the same as that used for the variability of distributions quantitatively stated. Thus the four classifications of hair colour—light, red, chestnut and dark—are placed in a quantitative scale and given the values 0, 1, 2, and 3, and some of the measures (*e.g.*, the standard deviation) of the extent of variation worked out as if the distribution were one of discrete variates which could take one of the above values but no intermediate value. Yet hair colour certainly gives a continuous distribution and it is erroneous to assume that those classified under "dark hair" are all equally dark, or that there is a clear line of demarcation between "dark" and "chestnut." We regret we have not space to deal with this example in more detail as its treatment is, in our opinion, the least satisfactory feature of the book.

A further criticism which will occur to any practical statistician reading this work is the fact that Professor Gini hardly seems to appreciate that he is dealing with samples only, and that what the student of statistics seeks for is to draw conclusions concerning the populations from which the samples are drawn. Not a single probable error or any indication of the range of variation in the indices to be expected through sampling is given in the whole book. One of the examples gives the distribution of marriages according to the day of the ceremony for Madrid (21,921), Cremona (726) and Berlin (21,220) (such distributions Professor Gini calls "circular series," since any day of the week can be taken as the beginning of the series), and indices showing that the variabilities of the three distributions are 1.58, 1.55 and 1.66 respectively are found, but no "probable errors" stated. Considering the fewness of the observations on which the figure for Cremona is based, we doubt very much if the numbers indicate any significant difference between Madrid and Cremona.

Some of the measures of variability employed by Professor Gini are merely alternative to the standard deviation and give little additional information of the nature of the distribution. To the statistician who proceeds systematically by the method of moments they offer nothing of great interest.

E.C.S.

5.—*La gestion par l'État et les municipalités.* Par Yves Guyot. viii + 438 pp., 8vo. Paris: Librairie Félix Alcan, 1913. Price 3 fr. 50 c.

In the preface to his recently-published volume entitled *The Economic Outlook*, Mr. Cannan remarks that the supply of certain local commodities tends almost inevitably to become the subject of monopolies, and that some kind of special control by the State or local authority is, therefore, absolutely necessary; and he adds that, "whether it is better in any particular case to entrust the monopoly to a company working for profit but under regulations intended to protect the consumers, or to entrust it to the local authority, is a question of detail, which depends on the character of the

commodity supplied, the kind of demand for it, the quality of the local authority, the quality of the company, the comparative probability of the local authority being debauched by subserviency to its own servants or by veiled bribes from the directors of a powerful local company, and on a host of other considerations which, taken together, quite rightly cause opposite decisions to be arrived at in different places at the same time and at different times in the same place."

So balanced a judgment, upon the much-debated question of State and municipal ownership and working of public utilities, would meet with no sympathy from M. Guyot. Though he asserts (p. viii) that his enquiry into the actual results of "State and municipal enterprise" was undertaken "*sans parti pris*," the reader of the volume before us, if he is not already of the same school of thought as M. Guyot, will, we think, be unable to rid himself of the belief that the general economic doctrines from which the author started rendered him in no small measure certain to pronounce an unfavourable judgment. Thus the first two sentences of the first chapter assert that "neither the State nor the communes ought ever to do anything which can be done by a private person. That is the economic principle"; and on p. 180 it is asserted that "the laws relating to unhealthy dwellings are a fresh interference with the rights of property." It may be admitted that the results of the system of "*régie directe*" in France have not been of a very satisfactory kind, and that in the light of experience and of present social and political conditions in that country it is reasonable for an independent French statesman to view with grave apprehension, or even to oppose actively, any extension of that system (by the immediate acquisition of railways, or otherwise); but it is, we submit, highly unscientific to allow one's economic convictions, and conclusions derived from the particular experience of one's own country, to influence one's consideration of the general problem. And it seems to us that this has happened, no doubt unconsciously to himself, in the case of M. Guyot. Though he gives as a rule a fair amount of statistical and other evidence in support of his assertions, he is inclined to quote the dicta of hostile critics of State or municipal action as though they were conclusive, but without any indications that he has tested their accuracy, or providing any means whereby others may do so. Thus, on p. 318, he quotes (without reference given) a statement of Lord Avelbury, to the effect that a municipal workman lays 300 bricks a day, whilst the American workman lays 2,000 to 2,700; and the observation of an anonymous alderman of West Ham, that "direct" construction results in a "monopoly of idleness." Similar instances will be found on pp. 161, 226, 248 and 257. Sometimes the suggestions are even more indefinite. Thus, on p. 297, after asserting that in State and municipal enterprises improvements in technique and machinery are retarded, because of the hostility of the employés, with consequent "material and moral depreciation" throughout the whole administration, M. Guyot adds: "*J'ai reçu plusieurs fois des confidences extraordinaires à ce sujet.*" No further information is

vouchsafed to us. Again, we have at p. 170 a short chapter headed "Victims of the Régie Directe," which details the suicide of a French provincial mayor who had carried through a municipalisation scheme which had not been immediately successful, and makes a few vague statements about Milwaukee. M. Guyot adverts in his preface to the case of the mayor, and is clearly of opinion that it is quite conclusive evidence of the economic inefficiency of State and municipal enterprise.

Some of M. Guyot's digressions are curious. We have a number of pages (408—414) devoted to the Panama Canal Dues controversy; the action of the United States Government appears to have convinced M. Guyot that Governments have no moral sense, and therefore ought not to be entrusted with the conduct of any monopolies. We appreciate M. Guyot's sympathy with the British case, but are not convinced as to the accuracy of his chief deductions. The suggestion that in 1909 the British Naval Intelligence Department over-estimated the German naval preparations is quoted as evidence that no Government can ever be correctly informed. The disastrous explosion on "La Liberté," in 1911, and the controversies as to the kind of explosives used by the French Navy to which it gave rise, are discussed at length (pp. 279—291), as proofs of governmental incompetence; though, curiously enough, the British Navy seems in the same chapter to be regarded as a model of efficiency in this matter of explosives. To the unprejudiced observer the two cases appear to cancel each other, and to be of no service to M. Guyot's argument.

For the rest, the case presented has little novelty. The arguments advanced are of the familiar type, and substantially all that can be seriously urged on the other side is omitted. The underlying assumptions throughout are that private action is always efficient and ever open to new ideas, and can never have an unfavourable effect on the standard of political morality. The fact that this is not always the case—that private undertakings are not always competently conducted or enterprising, particularly where they have a complete or partial monopoly; and that experience has shown that their efforts to acquire rights in respect of the supply of public utilities may take a most demoralising form—is ignored.

The book contains a large amount of material, though this (as we think we have shown) varies greatly in value, and, as was to be expected from the author, many suggestive remarks—with some of which we are in complete agreement, as in his criticism of the theory that the enterprises under discussion should never make a profit. But it does not appear to us to constitute any appreciable addition to the case against direct State and municipal ownership and working, as it has been formulated by Major Darwin and such American authors as Mr. B. H. Meyer; and, whilst it may exercise some influence in France, we doubt (for the reasons we have indicated) if it is likely to have any serious effect upon opinion elsewhere.

It may be added that the names of English boroughs are not infrequently misspelled; that Mr. Will Thorne did not become the

Parliamentary representative of West Ham in 1892; and that the suggestion, to which reference is made on p. 340, for the disfranchisement of municipal employes in the United Kingdom has never received any serious support. P.A.

6.—*Lohnsystem und Löhne in der Brauindustrie: Tarifverträge.* Eine Abhandlung über moderne Lohnprobleme und Lohnpolitik. Von Dr. Emil Wolff, Syndikus in Hannover. viii + 168 pp., Svo. Berlin: Carl Heymanns Verlag, 1912. Price 4 marks.

This interesting study of wage and other conditions in the German brewing industry, based on an examination of 63 wages agreements covering 430 breweries scattered throughout Germany, falls into two distinct parts. In the first the author, after some general discussion of the movement of industrial wages generally, in relation to price changes, proceeds to set out the principal results of his analysis of the brewing-trade agreements, to examine the legal rights of the parties under them, and to estimate their merits and demerits as a system of settling wages. The section (pp. 33—36) devoted to the last-mentioned subject is instructive, chiefly because it undoubtedly represents the opinions held by a large number of German employers. It is contended that the agreements are, from a legal standpoint, of no advantage, and, as regards the conduct of industrial enterprise on both the administrative and financial sides, positively disadvantageous to the employers. Dr. Wolff seems to regard the advance of wages and all efforts to raise them with grave suspicion; he dwells on the fact that an all-round increase of 1 mark per workman per week would lay on German industry the same burden as was laid on the whole nation by the Imperial financial legislation of 1909, apparently assuming that the economic effect would be the same in each case. And he finds in the rise of wages a potent cause of the recent advance in the cost of living, on the ground that the former carries with it an increase in the cost of production of commodities, and consequently in their price to the consumer. The space at our disposal does not render it possible, even were it necessary, to do more than indicate these theories, which are not likely, we imagine, to win any general acceptance, and we may pass to the more purely statistical portion of Dr. Wolff's work.

The rates of wages paid under the various agreements, and the hours and other conditions of labour, are examined in detail in the second section (pp. 36—106), which is followed by a statistical appendix of 51 pages; in this place we cannot do more than indicate a few of the results. The breweries are divided into three classes, according as the employes (i) receive, in addition to money wages, a fixed amount of beer which cannot be commuted for cash (35 agreements out of 63); (ii) receive a fixed weekly addition to wages in lieu of beer (17 cases); and (iii) can take beer or a monetary equivalent at their option (11 cases). In the second group there is, however, often the modification that the employé can spend the cash equivalent on beer for his own consumption during working hours at the normal reduced rate; and, on the basis of returns

from a number of breweries, it is estimated by the author that, approximately, 50 per cent. of the cash equivalent is so spent. It is characteristic of Dr. Wolff's attitude towards the whole wages problem that he thinks this fact—namely, that the workman is content with his money wages *plus* one half of the cash equivalent for his allotted quantum of beer—is conclusive evidence that his money receipts are sufficient to maintain him and his family at the standard of living regarded as satisfactory in their social class and locality. It must be assumed, he says, that in spending half of their cash equivalent on the consumption of beer during working hours, they are not neglecting the interests of their families; a somewhat debatable proposition.

The amounts of beer assigned vary with the particular occupations. As regards the brewers and maltsters, who form about 28 per cent. of the total number of persons directly employed in the breweries, the weekly allowance of beer averaged 28·6 litres, in the cases where it could not be commuted; in the cases where it is entirely commuted the cash equivalent averages 5·24 marks per week; where it is commutable, the cash equivalent averages 4·64 marks per week. On the assumption that in the two latter groups only half the weekly cash equivalent is taken, and on the basis of 300 working days per year, the ranges of yearly money earnings are in the three groups: (i) 1,554 to 1,749 marks; (ii) 1,531 to 1,676 marks; (iii) 1,546 to 1,741 marks. As regards the labourers (*Hilfsarbeiter*), who form about 15 per cent. of the total number of employes, the ranges, similarly calculated, are: (i) 1,296 to 1,458 marks; (ii) 1,268 to 1,381 marks; and (iii) 1,272 to 1,497 marks. These figures exclude earnings for overtime, &c., which are considerable. The predominant hours of labour in breweries working under the agreements examined by Dr. Wolff are 9½ (in thirty-four instances); in only six cases were they as low as 9, and in only two cases more than 10. The actual period of attendance at the breweries (*Arbeitsbereitschaft*) was in twenty-eight cases 11½ hours, and in twenty-two cases 12 hours.

Finally, attention may be directed to Dr. Wolff's suggestion, if we understand him rightly, that the comparative standard of living attainable by the pursuit of various occupations can be best measured by a comparison of the average rate of earnings therein with the "ortsüblicher Tageslohn" (that is, the rate of earnings of the poorest class of unskilled labour, as calculated for the purposes of the Insurance Acts) in the localities where the occupations are carried on; it being assumed that this "ortsüblicher Tageslohn" represents the existence-minimum. In the particular case before us, the average of the local rates (reckoning 300 working days per year) for all the localities to which the brewing agreements relate, was 907 marks: the average rate of monetary earnings for the brewery labourers was 1,361 marks, and increased for the other classes of workers employed inside the breweries up to 1,637 marks for the brewers and maltsters; that is to say, the average monetary earnings of brewery workmen ranged from 50 per cent. to 80 per cent. above the existence-minimum for their localities. P.A.

7.—*Die Finanzreformversuche im Deutschen Reiche von 1867 bis zur Gegenwart.* Unter Berücksichtigung der Deckung der Wehrvorlagen von 1912. Von Egbert Begemann. 145 pp., 8vo. Göttingen: Vandenhoeck und Ruprecht, 1912. Price 3 marks 60.

In spite of the changes made and new taxation imposed in 1909, it appears to be generally recognised that the financial arrangements of the German Empire are still far from satisfactory; and the discussion which raged round the reform of 1909, as to the principles to be adopted, still continues, though in a calmer atmosphere. Herr Begemann's contribution takes the form of a history of the federal revenue system since the formation of the North German Confederation; he is concerned, however, less with financial statistics than with the various attempts made to place at the disposal of the Imperial Government new sources of revenue, or to improve methods already in existence, and with the forces which have in most cases rendered those efforts of little avail. Within the limits which he has himself assigned, Herr Begemann has produced a narrative which, in spite of its compression and occasional aridity, is interesting and instructive to students of political institutions as well as to those who are concerned chiefly with problems of finance.

The main features of German financial history are now familiar. The general limitation of the Empire to indirect taxation; the system of Imperial subventions *to* the States, combined with the matricular contribution *from* the States; the piling-up of debt, owing to reluctance to require from the States the full contributions necessary to enable the Empire to pay its way; the failure to make any provision for debt-redemption; the constant need for new taxation, and the resultant struggles between the agrarian and industrial interests, culminating in the conflict of 1909—these are all brought out in Herr Begemann's sketch. The author is clearly opposed to the high protection policy which Germany has pursued in recent years for the sake of agriculture; he is a severe critic of the persistent attempts of the agrarian classes to throw the burden of taxation upon the industrial and commercial sections of the community, and of their hostility to the stock exchanges; he is, as we judge, convinced that the Empire must, if its finances are to be sound, have recourse more and more to direct taxation, especially in the form of estate duties, and seems to be favourably inclined towards the proposals (hitherto abortive) for an Imperial spirit monopoly. With the contention that direct Imperial taxation conflicts with the federal principle he has no sympathy; but he rightly, as we think, traces this belief, and the motives which led the Reichstag to insist upon the maintenance of the matricular contributions, voted annually, back to the distrust created by Bismarck's admittedly unconstitutional action, in the prolonged conflict with the Prussian Diet, only a few years before the formation of the German Empire.

This suggests one other point. Nothing is more striking in Herr Begemann's historical sketch than the relations between the executive and the legislature in matters of finance. However

carefully prepared the estimates and taxation proposals of the Government, the Reichstag generally went its own way—its changes were rarely well-advised or adequately considered; the Government was, and is, powerless to insist upon the acceptance of its proposals—it can never count upon a majority; the Reichstag was, and is, irresponsible. The financial history of the Empire is full of examples of the resultant evils; the crowning instance came in 1909, when the Imperial Government, after some struggle, practically divested itself of responsibility, and allowed the dominant party in the Reichstag to do as it chose. The result was a hasty and ill-considered scheme of reform which, whilst it provided sufficient money for a time, was dictated by the economic interests of a single class, offers nothing like a permanent solution, and has left a very large and important section of the nation smarting from a sense of injustice. In drawing attention to this grave practical disadvantage of merely representative, as distinct from responsible, government, Herr Begemann has performed a useful service, even though he seems to have done so almost without intention. P.A.

8.—*Der Geburtenrückgang—Die Rationalisierung des Sexuallebens in unserer Zeit.* Dr. Julius Wolf. vi + 253 pp., 8vo. Jena: Gustav. Fischer, 1912. Price 7s. 6d.

Der Geburtenrückgang in Deutschland, seine Bewertung und Bekämpfung. Dr. J. Borntraeger. 168 pp., 8vo. Berlin: Richard Schoetz, 1912. Price 3s. 9d.

Die Beschränkung der Geburtenzahl ein Kulturproblem. Dr. Julian Marcuse. 151 pp., 8vo. München: Ernst Reinhardt, 1913. Price 2 m. 80 pf.

Although a decline in the birth-rate is as apparent in England as in Germany, the volume of publications devoted to the subject is smaller in this country than across the Rhine. This is no doubt due to the fact that the average educated German's social philosophy is more sincere or less sophisticated (the choice of adjectives depends upon one's point of view) than our own. The authors of the three books under notice come from different sections of the professional class, approach the problem from different sides and reach widely different results.

Dr. Wolf is a university professor, and his book is more avowedly statistical than the others. The first chapter contains a brief abstract of the statistics demonstrating the fall of the birth-rate which has obtained in most countries during recent years. The second, and longest, chapter reviews the evidence which has been adduced in support of various explanations. Hypotheses favoured by various economists and statisticians are severely handled; the view that a falling birth-rate is a consequence of improved economic well-being is especially singled out for attack and finally dismissed with the remark that it contains but a grain of the truth. Dr. Wolf attaches most importance to the change of ethical ideals in modern times, epiphenomena of which are the spread of social democracy, the alteration in the status of women and the lessened influence of religion upon the masses. He specially emphasises the fact that in

those countries in which the Roman Catholic Church has retained its power over the laity, the birth-rate has not, with certain relatively unimportant exceptions, fallen at the same rate as elsewhere, and that, in particular, in countries professing the Greek Orthodox Faith the fall has been slight or non-existent. The great absolute and relative increase of the population of European Russia evidently fills Dr. Wolf's mind with misgivings. Various proposed methods of arresting the decline in the birth-rate are considered and their probable effects characterised in language which is by no means optimistic. A special appendix is devoted to the subject of infant mortality and methods of combating it. The work preserves a fair measure of impartiality, but it cannot be denied that the *apparatus criticus* Dr. Wolf brings to bear upon Mombert's views would certainly not leave his own unscathed. Merely regarded as a statistical problem, the subject is so complex that the most refined instruments of statistical research may well prove inadequate to the task of isolating the primary from the host of secondary phenomena. Dr. Wolf's treatment of statistical material does not seem to argue the possession on his part of any special acquaintance with the inherent difficulties of the subject regarded from this point of view.

Dr. Borntraeger is, we imagine, a member of the Public Medical Service, and his work seems to bear the stamp of official approbation. The author asserts at great, perhaps at too great, length that something must be done to arrest the decline of the birth-rate. An immense number of proposals having that end in view are scheduled, long extracts are cited textually from authors of whom Dr. Borntraeger approves and almost equally long passages are culled from writers to whom he is opposed; in the former case, glowing panegyrics are pronounced, in the latter, Dr. Borntraeger resorts to the rather primitive device of interspersing notes of exclamation and appending what are intended to be withering sarcasms. We do not think it necessary to examine in detail Dr. Borntraeger's specific proposals, some of which involve an extension of bureaucratic control which would be intolerable.

Dr. Marcuse's book is the shortest of the three and also, perhaps, the sanest. He endeavours to keep constantly in view the bearing on the population problem of a multitude of social and economic developments, which cannot be summed up in any one theory or in mere compilations of statistics. He points out the error of supposing that the present decline in fertility necessarily connotes either "race suicide" or national degeneration, and is rightly scornful of official doctrinaires, who, while preaching to the general public that to rear a large family is the duty of a patriotic citizen, themselves enact stringent rules as to the marriage of public servants. The eugenists come in for drastic criticism, and in this section of his book the author tends to pass the bounds of moderation. We recognise that he has some excuse for impatience, certain eugenic proposals do indeed remind us of a remark in the mouth of one of Hawthorne's characters, viz.: "a most irreverent propensity to thrust Providence aside, and substitute one's self in its awful place."

Nevertheless, when we have made due allowance for the exaggerations of propagandists, we are forced to recognise that the "survival of the unfittest" is more than a catch word, and that the question of differential fertility does indeed merit close attention. We believe, however, that many of Dr. Marcuse's criticisms deserve notice, and that his book might profitably be studied by all who write and speak upon the serious problem in question. M.G.

9.—*Die deutsche überseeische Auswanderung. Ein Beitrag zur deutschen Wanderungsgeschichte.* Von Wilhelm Mönckmeier. x + 269 pp., 8vo. Jena: Gustav Fischer, 1912. Price 9 marks.

Dr. Mönckmeier has covered a good deal of ground in this historical survey of the oversea emigration from Germany. The available statistics for both early and recent times are incomplete, but the margin of error cannot be so great as to vitiate the general picture which they present of the course and amount of this emigration during the period investigated. The causes and effects of the emigration, the origin and destination of the emigrants, their distribution between the sexes and according to age and occupation, and the policy and attitude of the State, form the principal heads under which the subject is treated. As was doubtless to be expected, Dr. Mönckmeier finds that although politics and religion have played their part in causing emigration, especially in early times, yet the main causes have been, and are, social and economic—economic pressure at home during times of bad harvests, bad trade, &c., and always the "pull" of new lands (in Germany's case, principally the United States of America) with their rich economic opportunities. But the rapid industrialisation of Germany in recent years, creating a great demand for labour, and the diminishing attractiveness of the United States, have caused German emigration to fall to the comparatively small dimensions familiar to students of certain current political controversies. The author now looks to German emigrants abroad to form "economic colonies," which shall strengthen and extend the economic power of the Fatherland. These are but a few of the many aspects of the subject treated by the author. He has not, of course, as he himself admits, exhausted the subject of German emigration—for example, he has limited himself to oversea emigration—but he has produced a book which should prove of interest to the general reader and very useful to other investigators. A.D.W.

10.—*The Economic outlook.* By Professor Edwin Cannan. 312 pp., 8vo. London: Fisher Unwin, 1912. Price 5s. net.

In this book Dr. Cannan has reprinted a selection of articles and papers written by him at various times within a period of about thirty years. It might have been thought that "The Economic Outlook as it has been" would have been a more appropriate title, but the world moves so very slowly that the existing title is satisfactory enough—as Dr. Cannan says with reference to one of the essays, "No change in law or practice has taken place since that time, so that the essay is still, like many things fourteen years old, quite up to date." In the introduction the method pursued in the author's

"Production and Distribution," in which the views of early economists were shown to be a product of their circumstances, is repeated to account for the papers that follow. Thus the essay on "The Economic Ideal and its Application to Countries or Nations" was "written on the windy coast of county Clare, after a week spent in travelling from Larne by the north coast to Londonderry and thence through Connemara and Galway. A journey better calculated to stimulate the inquiry, What should be the national economic ideal? would be difficult to devise." The autobiographical running commentary is most entertaining and full of good things, both witty and wittily acute. It is to be hoped that more of the same sort may be induced to come from the same pen. One very suggestive point is made with reference to the general harmony between the pursuit of self-interest and the common good. It is attributed "to the success of society, continued throughout history, in establishing and gradually modifying its institutions so as to make them as suitable as possible to the circumstances of each period of human development. A man's intelligent pursuit of his own interest generally serves others besides himself, simply because the institutions of society provide hedges which are generally close enough to keep him on the road. When it is found that institutions fail to make it the interest of each man to serve the rest, society abandons or modifies them." In short the explanation given is survival of the fittest, only you would never catch Dr. Cannan putting it in that technical way. In the seventh essay, Dr. Cannan returns to the thesis of chapters vii and viii of his *Production and Distribution*. However, though I for one am prepared to plead guilty to the charge—the pilloried professor might quite well have been me—I do not feel in the least convicted of sin in this matter. Because Dr. Cannan is virtuous shall there be no more cakes and ale? An inquiry into what he calls "real distribution" is much to be recommended, but must we therefore give up seeking the causes of wages per head, profits per cent. and rent per acre? Indeed, does not Dr. Cannan himself prove that we must not in that he himself has recourse to accepted doctrines of distribution in telling us how to do what he wants done? The causes of anything are worth discovering, and are very apt to come in useful at some time. As to that earnest student who kept button-holing the professor (pp. 219–25), I know him well. I always thought his chief fault was that he wanted to run before he could crawl.

It is Dr. Cannan's *forte* to make errors expose their absurdities, and, when he likes, so paraphrase high-sounding doctrines that they seem foolishly self-evident. Instances innumerable will be found in these pages. There is also in them a repeated unexpectedness in point of view which is highly stimulating. No better example can be given than the turning of the tables on Mr. Loch in the eighth essay. How it is done can be found out by referring to the essay. This book will be read by all with delight; and by most economic writers with a little annoyance at the thought that they cannot put their own opinions, particularly when they are opposed to Dr. Cannan's, in the same aggravatingly brilliant way.

S.J.C.

11.—*Principles of economics*. By Dr. N. G. Pierson. Vol. ii. Translated from the Dutch by A. A. Wotzel. 644 pp., 8vo. London : Macmillan and Co., Ltd., 1912. Price 10s. net.

In September, 1902, the *Journal* contained an account of Dr. Pierson's well-known book, together with a short outline of the varied activities of its author. The first volume, in Mr. Wotzel's translation, has been well known in this country for several years; the appearance of the translation of the second volume, which will be heartily welcomed by all who have read the first, offers an opportunity to make a few more observations.

To the translator the highest praise is due; the book does not read as if it were a translation, and yet has a distinctive style. We seem to feel that the personality of the author has not been veiled by the translator. Occasionally, in the parts which relate to land tenure, and involve legal conceptions, the difficulty is almost insuperable, because of the fundamental differences between English and Continental systems of law; thus *Erfpacht*, which is rendered "inheritable leasehold," seems to be almost the same as a leasehold interest; but in England leases are not "inherited," nor are leases perpetual (though they may contain a covenant for perpetual renewal). In a few such cases a translator must be defeated, but it is very difficult to outmatch Mr. Wotzel.

The salient characteristics of Dr. Pierson are simplicity and lucidity and candour. One is sometimes tempted to complain that he makes the subject too clear and simple; and there would be some justice in such a complaint. In those parts of the subject which require a profound and searching analysis, a careless reader might be led to suppose that things and tendencies were simpler than they really are. Great as the merits of this volume are, there are parts which fall below the general standard of excellence. In discussing Socialism, for instance, the author is not very discerning; in discussing Henry George's proposals the author (strange as the assertion may appear) seems to have missed the point. No doubt Henry George's flowing style and the language often used by single taxers is very disconcerting, but there is a fundamental and obvious difference between that part of the value of a hereditament which is due to buildings, drainage or improvements, and that part which is due to the site alone. It is certainly most unfortunate that Dr. Pierson's customary acumen should have failed in discussing a matter which may become a political question. It would have been more useful had he pointed out that in a country such as England the expenditure of the State is greater than the annual site values of the land, which shows that the single tax is hardly a practical proposal.

The subject of land and land tenure in England has been studied by Dr. Pierson with considerable care, and he devotes a good deal of space to it; but the subject is so complex and the facts so difficult to ascertain that it can hardly be quite efficiently treated by one who is not an Englishman. It is this part of the book which is the least satisfactory. Is it true that the majority of the English people would be reluctant to abandon this land system? No doubt the big landlords and the wealthy cling to it;

expense and complications are an advantage to these classes ; but it can hardly be asserted that the middle class like it. On the contrary, practically all settlements of land by middle-class people (whether by deed or will) are made in the form of a trust for sale ; that is so far as is possible the land is settled as if it were personalty and not realty. The democracy are not interested because they have so little land ; the Enclosure Acts did their work most effectively. The explanation, therefore, of the fact that there is no effective agitation to make any fundamental alteration in the English law of land may be that the upper class are strongly opposed and the working class completely indifferent ; not that the system works well, or that the majority of the people really wish to retain it, and there are signs that an attack on the system would be far from unpopular.

It is too much to expect that at the present time the author's arguments on Protection would be completely accepted by everyone ; they do not go into the more difficult parts of the controversy, and preferential trade is not discussed. Still they form a valuable and sober statement of the position.

The most admirable part of the book is that which discusses Neo-Malthusianism. Here the author's fairness has led him to treat the subject in a way which is eminently scientific, and which offers a model to all authors who have to deal with any important topic which rouses deep feelings.

In conclusion it may be remarked that this standard work would be more valuable if it contained an Index. C.P.S.

12.—Other New Publications.*

Bellom (Maurice). La législation belge d'assurance contre l'invalidité (Loi du 5 Mai, 1912). 22 pp., 8vo. Paris : A. Rousseau, 1913.

[A short account of the genesis and present definite form of the Belgian law of May 5, 1912, relating to insurance against sickness. Its relation to the earlier law dealing with insurance against old age is also described and similarly its relations with voluntary provident institutions already in existence.]

Dicksee (Lawrence R). Depreciation, Reserves, and Reserve Funds. "The Accountant's Library." Vol. xxvi. 3rd edition. 80 pp., 8vo. London : Gee and Co., 1912. Price 3s. 9d. net.

[The author remarks that the subject of this book is one of the most vexed questions in accountancy, and one upon which divergent views are held by authorities of almost equal acceptance. He believes, however, that there has been a certain confusion of what are matters of opinion with matters of scientific fact, and he has endeavoured, by separating them, to put forward an impartial and unbiassed statement for the help of those wishing to study the subject.]

Finizio (Prof. Gaetano). Relazione sulla Tutela del Lattante (Società Pediatrica Italiana). 49 pp., 8vo. Padova, 1912.

[A report on measures taken in different countries for the protection of infant life, legitimate and illegitimate.]

French (R. D.) and Gee (A. L.). The Accountants' Pocket Diary and Reference Book for 1913. 8vo. London : Gee and Co., 1913. Price 2s. 6d. net.

[This book contains in addition to the information usually found in diaries, much information of a nature required by accountants and other professional men and not readily obtainable in so compact a form.]

* See also "Additions to the Library," page 352, *sqq.*

Henry (Robert). Who Pays? An inquiry into the real incidence of Taxation. 76 pp., 8vo. London: George Allen and Co., 1912. Price 2s. 6d.

[These reflections on taxation have been recorded with the intention of showing that certain political measures cause other effects than those which are their final aim, and that some of these effects can and should be foreseen. The argument is illustrated by charts and diagrams.]

Holmes (Arthur). Conservation of the Child. A manual of Clinical Psychology presenting the examination and treatment of backward children. 345 pp., 8vo. Philadelphia and London: J. B. Lippincott Co., 1912. Price 4s. 6d. net.

[The author's aim is to give a practical description of the inauguration and working of a psychological clinic, though not attempting to go into the abstract principles underlying clinic methods. While several systems of mental tests are given, no extended discussion of their psychological bases has been offered, nor has any exhaustive criticism of the definition and classification of mental defectives been attempted.]

Watson (Alfred William). Friendly Society Finance considered in its Actuarial Aspect. A course of lectures delivered at the Institute of Actuaries during the session 1911-12. 132 pp., 8vo. London: C. and E. Layton, 1912. Price 6s. net.

[These lectures were delivered at the instigation of the Council of the Institute of Actuaries, who considered that, as a consequence of the passing of the National Insurance Bill, Friendly Societies were destined to play an important part under the new law. The author's endeavour has been to bring into prominence problems which are of actuarial interest in the operations of Friendly Societies. As these are likely to be extended in the future, it is probable that the field of actuarial activity will likewise be enlarged, and it is hoped these lectures will be of service to the actuaries concerned.]

An Encyclopædia of Industrialism. Nelson's Encyclopædic Library. 543 pp., sm. 8vo. London: T. Nelson and Sons, 1913. Price 1s. net.

[The aim of this work is to describe the problems both practical and theoretical which arise from the modern development of manufactures. The articles have been written by experts and in most cases are initialled. The book does not claim to be an encyclopædia of economics or of social questions at large; and where these subjects are discussed, the special industrial point of view has been maintained. The book is a most useful manual and its price puts it within the reach of all interested. It should be dated.]

Steam boilers. Memorandum on Steam boilers. 38 pp., fol. London: Wyman and Sons, 1912. Price 1s. 3d.

[Drawn up for the guidance of occupiers and men in charge of boilers. There are several tables dealing with explosions and accidents caused by boilers for a series of years.]

United States. Care of tuberculous wage-earners in Germany. Bulletin U. S. Bureau of Labor. Whole No. 101. Workmen's Insurance and Compensation Series, No. 1. 183 pp., 8vo. Washington, 1912.

[A general description of the movement in Germany against tuberculosis under the Invalidity Insurance Law which came into force on January 1, 1900. Details are given as to the cost of the movement, the numbers of patients treated, with the results, and the numbers and equipment of the different sanatoria. The report shows that the movement is thoroughly organised and sustained by ample funds and that the results of the systematic treatment of the disease have been of a satisfactory nature.]

CURRENT NOTES.

The trade returns continue to show an increase in the value of both imports and exports. The subjoined tables compare the returns of the twelve months ending January, 1913, with the twelve months ending January, 1912 :—

[000's omitted.]

Imports.	Twelve months ending January, 1913.	Twelve months ending January, 1912.	Increase (+).
Imports, value c.i.f.—	£	£	£
I. Food, drink and tobacco	278,729,	267,523,	+ 11,206,
II. Raw materials and articles mainly unmanufactured	280,522,	246,821,	+ 33,701,
III. Articles wholly or mainly manufactured	186,958,	167,599,	+ 19,359,
IV. Miscellaneous and unclassified (including parcel post)	2,966,	2,485,	+ 481,
Total merchandise.....	749,175,	684,428,	+ 64,747,
Imports of bullion and specie	68,257,	65,216,	+ 3,041,

[000's omitted.]

Exports.	Twelve months ending January, 1913.	Twelve months ending January, 1912.	Increase (+).
Exports of produce and manufactures of the United Kingdom, value f.o.b.—	£	£	£
I. Food, drink and tobacco	32,660,	29,315,	+ 3,345,
II. Raw materials and articles mainly unmanufactured	60,341,	54,242,	+ 6,099,
III. Articles wholly or mainly manufactured	389,412,	363,964,	+ 25,448,
IV. Miscellaneous and unclassified (including parcel post)	10,050,	9,284,	+ 766,
Exports of foreign and colonial merchandise, value f.o.b.—			
I. Food, drink and tobacco	15,241,	14,432,	+ 809,
II. Raw materials and articles mainly unmanufactured	68,184,	60,354,	+ 7,830,
III. Articles wholly or mainly manufactured	29,351,	28,780,	+ 571,
IV. Miscellaneous and unclassified (including parcel post)	172,	146,	+ 26,
Total, British, foreign and colonial	605,411,	560,517,	+ 44,894,
Exports of bullion and specie	64,945,	57,320,	+ 7,625,

[000's omitted.]

Shipping.	Twelve months ending January, 1913.	Twelve months ending January, 1912.	Increase (+).
Total, British and foreign, <i>entered</i> } with cargoes	Tons 46 349,	Tons. 42,372,	Tons. + 3,977,
Total, British and foreign, <i>cleared</i> } with cargoes	62,479,	59,784,	+ 2,695,

It is announced that Mr. Augustus Sauerbeck has given up the compilation of his "Index-Number of the Prices of Commodities," and that, commencing with this month, the index-number will appear in the *Statist*. The index-number for January is 86·4, the same as in December, 1912, the average of the eleven years 1867-77 being taken as 100. There has been no fresh advance in the index-number in January, a small rise in food having been attended by a decline in materials. On the average, vegetable food has not advanced, rises in wheat, barley, oats, and maize having been attended by declines in flour and rice. Meat is dearer, owing to the substantial advance in mutton. Sugar and coffee are cheaper. The fall in materials arises from the heavy declines in copper and lead. Pig-iron and tin are also somewhat lower, and cotton is cheaper, but jute, wool, flax, and silk are somewhat higher. In the aggregate, minerals show a substantial decline, while raw textiles are slightly higher. Among sundry materials, tallow, nitrate, and palm oil are higher in price. Articles of food were 79·2, as compared with 78·4 in December, and materials 91·7 as compared with 92·2. The *Economist* index-number stands at 273·2, as compared with 274·7 in December.

According to the Board of Trade *Labour Gazette* the state of the labour market last December was as follows:—

	Trade Unions making returns. Net membership.	Reported as unemployed.	
		Number.	Percentage.
December, 1912	894,297	20,938	2·3
November, 1912	887,350	16,142	1·8
December, 1911	788,986	24,074	3·1

Employment continued good in December. In the engineering and some other trades it was affected by the usual holiday suspensions, and in the North of England there was some interruption arising from the strike on the North-Eastern Railway, especially in coal and iron mining and in the iron and steel industries. There

was a seasonal decline in the building, woodworking, and printing trades. The upward movement in wages continued. Compared with a year ago, there was an improvement in nearly all the principal industries, and especially in the pig-iron, iron and steel, engineering, printing, and brick trades.

A Paper by Mr. P. D. Leake, entitled "The Use and Misuse of "the Sinking Fund," which was read before the Chartered Accountant Students' Society of London, has been reprinted in pamphlet form. In the course of the paper the writer points out that the existence of the Sinking Fund is apt to create a false sense of financial security, since it may be raided, while the provision made by the annual instalments of money devoted to building up the Sinking Fund is admittedly inadequate for the present time, its adequacy being dependent on the assumption that the fund will not be interfered with at any future time within the period of its intended development. The Sinking Fund method of finance, the writer continues, thus discounts the future to an altogether unjustifiable extent, for experience has amply proved that obligations of this nature are not considered sacred, but are regarded as subordinate to the financial convenience of the present. Whenever a Sinking Fund is tampered with the effect is *ipso facto* to render inadequate the financial provision made up to that time. In conclusion, the writer suggests that, owing to the inevitable uncertainty of the future and the impossibility of making binding contracts extending over a great number of later years, it would seem to be far better to abolish the common use of the Sinking Fund method of providing for the future repayment of loans, in favour of applying the money then and there to pay off the loans, either by annual drawings and by purchase of the loan stock in open market, and its cancellation.

The first Report of the recently organised Labour and Industrial Branch of the Australian Commonwealth Bureau of Census and Statistics has been issued. The scheme of work of the Branch provides for systematic investigations into Trade Unionism, wages and hours of labour, strikes and lock-outs, unemployment, prices, fluctuations in exchange value of gold and cost of living, investigations in regard to the principal industries in the Commonwealth, and other matters such as *inter alia* immigration, industrial accidents, co-operation and co-partnership, &c. Concurrently with the general inquiries to be conducted by the Branch (as specified above) it is proposed that investigations shall be carried out into special matters. Each of these is to extend, if necessary, over a period as long as one or two years, and would deal with such matters as

apprenticeship, employment of women and children, workmen's compensation and social insurance, &c. The first report by the Commonwealth statistician, Mr. G. H. Knibbs, C.M.G., is entitled "Prices, Price Indexes, and Cost of Living in Australia." The main object of the report is to furnish information as to prices in past years in such a form as to be fully comparable with that which it is proposed to publish periodically in the future. The different methods available for constructing index-numbers are discussed in considerable detail, and it has been decided to use an index based on the cost of a standard list of commodities. On the basis of wholesale prices in Melbourne, the rise in prices in 1911-12 compared with 1891-95 is some 29 per cent., compared with 1901-05 about 11 per cent. Data for retail prices in the metropolitan towns of Australia have been collected for 1901 and subsequent years, and show comparatively little change, but the rise in house rents during the decade has been over 30 per cent. (755 to 1,000) and the rise in the cost of living consequently considerable. The Bureau has collected a great mass of information as regards both retail and wholesale prices, as well as house rents, and the future reports of the series will be looked for with interest. A further report will be issued in the course of a few months furnishing information for past years as to Trade Unionism, Employment and Unemployment, Rates of Wages and Hours of Labour and other matters of a cognate nature.

The thirteenth volume of the Report on the "Condition of Woman and Child Wage-Earners in the United States" (19 volumes) dealing with "Infant Mortality and its Relation to the Employment of Mothers," has been issued. The inquiry has been undertaken in pursuance of an Act of Congress, passed in 1907, directing the Secretary of Commerce and Labour to report upon "the industrial, social, moral, educational, and physical condition of woman and child workers in the United States." The Report is presented in two parts, of which Part I, "A Study of Massachusetts Statistics," has been written by Mr. E. B. Phelps, and contains a mass of figures relating to infantile mortality in Massachusetts during the 53 years 1856-1908 and shows how they compare with the rates prevailing in this and other countries. The Massachusetts figures are analysed with reference to the proportions of foreigners (foreign-born inhabitants), and to the proportions of women workers. Mr. Phelps in his conclusions remarks: "It has often been customary, in approaching statistically the subject of the employment of married women in its relation to infant mortality, to ignore the many other complex social and economical factors having a bearing upon the problem. . . . In the cities of New England certain of these factors

"which have been ignored in the past in the consideration of the "problem are with fair uniformity coexistent with a high infant "mortality rate; these being (1) a high proportion of foreign-born, "(2) a high female illiteracy, and (3) a high birth-rate." Part II—the results of a special inquiry conducted at Fall River—is the more interesting part of the Report. Fall River is described as the largest textile city in the United States devoted almost exclusively to cotton goods. It is almost surrounded by water, lies 200 feet above sea level and is only 20 miles distant from the open sea. "There are cool breezes throughout the summer, and the nights "are rarely warm. The city's water supply, because of a modern "filtering plant, is considered exceptionally pure." "Fall River is "distinctly desirable as a place of residence." At the census of 1905 44.4 per cent. of the total population were foreign born, while of the females aged 10 years and upward 38.6 per cent. were "gainfully employed," 29.8 per cent. being workers in the cotton mills. Illiteracy—the standard is not stated—is high, 15.1 per cent. of the total population and 13.4 per cent. of female mill operatives being so classed. In 1908 (the year selected for the inquiry) the population was estimated at 112,500 persons. The births in that year numbered 4,835 (exclusive of 227 still-births), the birth-rate was 43 per 1,000 and the total death-rate 20.5 (mean 1900-09, 20.3). The infantile mortality in that year was 178 per 1,000 births registered. It should be observed that a doubt is expressed as to the completeness of registration. "An analysis "of the causes of death (at ages under one year) and of the relative "number dying from each cause shows a percentage of deaths from "premature birth so low as to suggest either that some deaths "from this cause were not reported or that, if reported, they have "been included under congenital debility." The outstanding feature of the infant mortality is the high proportion of deaths due to the diarrhoeal diseases (diarrhoea, enteritis and gastritis), which was 38.3 per cent. of all deaths at ages (0—1 year) during 1908 and 36.7 per cent. during the years 1900-09. The mortality in Fall River during 1908 due to those diseases was 81 per cent. above that recorded in Manhattan, 105 per cent. above that in Boston, 215 per cent. above that recorded in England and Wales and 161 above that in Blackburn, which town was selected as most nearly comparable with Fall River. In the foregoing comparison the rates for the same year were used throughout except in the case of Blackburn the data for which were "for a ten-year "period." Nearly one-quarter of the deaths under one year of age occurred in the first month of life, two-thirds of those deaths being due to premature birth, congenital defects and debility.

"The early age at which these deaths occurred and the constancy of the death-rate at these ages and from the causes named indicate that the fundamental causes are to be found in antenatal conditions. It is especially significant that . . . for the children of mothers who were at work outside the home during pregnancy the proportion was slightly less than that for children of mothers who were at home and engaged only in house work." With regard to post-natal influences it is recorded that only 14.4 per cent. of the children, concerning whom information was forthcoming, were found to have been deprived of the mothers' care by their going out to work, and only 7.9 per cent. had to be "hand-reared" on account of such work. On the other hand, the mortality among such children from the diarrhoeal diseases—measured by the percentage of diarrhoeal deaths to all deaths (0-1 year)—was over 80 per cent. higher than that observed among children whose mothers remained at home. "The high infantile mortality . . . is not due, except in a very small part, to the excessive rate among the children whose mothers are at work outside the home. For the proportion of deaths due to diarrhoea, enteritis and gastritis, 38.6 per cent. of all, for the city as a whole, only falls to 34.6 per cent. when the children of mothers at home are taken separately." Among mothers at home 34 per cent. of the children were fed exclusively at the breast, 24 per cent. were given solid food, and for 16 per cent. condensed milk was the principal food. The corresponding figures among the children of mothers working away from home were—1.2, 40 and 30.5 respectively. "By both classes of mothers condensed milk was used more generally than fresh cows' milk. In over one-third of the cases where solid food was given its use was begun during the first week." Deficiency of breast milk was the reason most commonly put forward as the excuse for artificial feeding, and such deficiency appears to have been more common among mothers staying at home than among those going out to work. "The causes of the excessive infant mortality in Fall River may be summed up in a sentence as the mother's ignorance of proper feeding, of proper care, and of the simplest requirements of hygiene. To this all other causes must be regarded as secondary"—conclusions which are in accord with the experience of every one who has given any time and attention to the combating of infantile mortality.

A Report on "Supply of Farm Labor," by Mr. George K. Holmes, has been issued by the Bureau of Statistics of the United States Department of Agriculture. The report is stated to be the first comprehensive treatment of farm labour in regard to supply

which has been published. It is shown that 83·1 per cent. of all persons reported as having remunerative occupation were employed in agriculture in 1820. The fraction declined to 77·5 per cent. in 1840, to 47·3 per cent. in 1870, to 44·1 per cent. in 1880, to 37·2 per cent. in 1890, and to 35·3 per cent. in 1900. While the percentage has declined, the absolute number of persons engaged in agriculture has increased to a large figure. The number was 2,068,958 in 1820 and 10,249,651 in 1900. The census is stated to indicate the general rule that one person employed in 1900 supports 2·6 persons including himself; and applying this rule to agricultural occupations it is computed that the agricultural population of the United States in 1910 was about 35,000,000. As regards agricultural labourers (*i.e.*, persons who work on farms for hire and supply most of the manual labour of the farm that is not supplied by the farmer and members of his family who do not receive wages), it was reported in 1870 that the number was 2,885,996, and in 1900 4,410,877, or over 50 per cent. The fraction of all hired agricultural labourers has declined from 48·7 in 1870 to 43 per cent. in 1900. In 1890 the fraction declined to 35·5 per cent.; and it is suggested that this decline was due to the then recent acquisition of an enormous number of new farms by men unable to hire labour. The negro agricultural labourers increased from 1,106,728 in 1890 to 1,344,116 in 1900; but although the actual number shows an increase it diminished relatively to the total number of negroes having agricultural occupations, or from 64·9 per cent. of the negroes of all agricultural occupations in 1890 to 63·7 per cent. in 1900. Negro agricultural labourers, as an element of the total number of labourers of all races having agricultural occupations, are represented by 36·8 per cent. in 1890, and 30·5 per cent. in 1900, a decline in ten years of 6·3 in the percentage. This accords with the generally accepted conclusion that a smaller fraction of the cotton crop is raised by negro labour year by year.

An article by Professor Irving Fisher entitled "A more stable gold standard," which appeared in the *Economic Journal* for December last, has been issued in pamphlet form. Its purpose is to explain a plan for overcoming the advance in the general level of prices measured in standard gold currency. Professor Fisher wishes to replace the existing system of currencies based on full-valued gold coins in favour of representative currencies, the gold equivalent of which should be adjusted at regular and frequent intervals so as to maintain an approximately steady purchasing power for the money unit. The situation produced after such a system had been in use during a period when gold prices had risen 25 per cent. would be

that the money unit in this country, that is the pound, would be determined in relation to gold by the offer, on the part of the Government agents charged with this duty, of a price of 3*l.* 1*s.* 8*d.* per ounce for gold, while they would be ready to sell at 3*l.* 2*s.* 3½*d.* per ounce, the difference of 7½*d.* representing a charge aimed at preventing speculative operations in anticipation of a change in the official prices. The changes in the official prices would be determined in accordance with an official index-number, and no single change would be allowed to be greater than the margin (taken above as 1 per cent.) between the official buying and selling prices of gold. It is, perhaps, less difficult to conceive of the introduction of such a plan in a country in which gold coins play a relatively small part in ordinary life than in such a country as ours, where the idea of reducing the sovereign from the status of a full-valued to that of a token coin would encounter no small opposition. Professor Fisher anticipates that, for some time to come, prices under the existing arrangements may be expected to advance at something like 2 per cent. per annum on the average. He is, therefore, not greatly concerned about the measures to be taken in case the value of gold should return to and rise above the present level. Should this occur, the adjustments on the plan outlined would necessarily cease, unless all gold coin were withdrawn and replaced by notes and coins of less metallic value, though of unchanged face-value. The plan cannot be conveniently discussed in an editorial note, but the suggestion of a probable margin of 7½*d.* per ounce between the buying and selling prices of gold bullion is somewhat startling to English readers of Professor Fisher's various pamphlets and articles. An adjustment of the official prices monthly instead of quarterly would, however, admit of narrowing this margin without sacrificing the end which is sought to be attained by its means.

The first number has been issued of the *Bulletin of the British Library of Political Science*, which will appear quarterly under the direction of the London School of Economics. The object of this publication is strictly practical. It will record the valuable donations which the Library continuously receives and will contain, from time to time, annotated lists of additions, as well as selected bibliographies on special subjects. But its main purpose will be to make known the *lacunae* of the collection, and to specify *desiderata*, in the hope of encouraging further donations. At the same time, selected lists will be given of duplicates available for exchange, with a view to extending still further the exchange arrangements with other libraries. The Bulletin will be sent regularly upon issue at the charge of one shilling per annum to cover postage, &c.

The degree of Master of Arts (*honoris causa*) has been conferred by Cambridge University upon Mr. G. Udny Yule, University Lecturer in Statistics.

We regret to have to record the death of Dr. John F. J. Sykes, Medical Officer of Health of St. Pancras, who was elected a Fellow in 1900, in which year he won the Howard Medal for his Essay on "Housing of the Working Classes in London and other large towns." The Essay was read before the Society in the following year, and is contained in the JOURNAL for June, 1901.

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

Economic Review. January, 1913—The economic basis of universal peace—cosmopolitan or international? *Cunningham* (*Ven. Archdeacon*). Juvenile labour in Germany: *Lesser* (*Ernest*). The price paid for Chauvinism in Japan: (*Aum.*). Co-partnership and labour unrest: *Furniss* (*H. Sanderson*). Legislation, parliamentary inquiries and official returns: *Dougan* (*J. L.*).

United Empire (*Royal Colonial Institute Journal*). January, 1913—Rise in prices within the Empire: *Grice* (*Dr. J. Watson*).

UNITED STATES—

American Economic Review. December, 1912—The definition of price: *Fetter* (*Frank A.*). Transportation and competition in South American markets: *Willis* (*H. P.*). The impatience theory of interest: *Seager* (*H. R.*). Agricultural credit in the United States: *Kemmerer* (*E. W.*).

Journal of Political Economy. January, 1913—The aim and content of the undergraduate economics curriculum: *Wolfe* (*A. B.*). Sequence in economics courses at the University of Chicago: *Marshall* (*Leon C.*). Some economic aspects of immigration before 1870. II: *Page* (*Thomas W.*). Early canal traffic and railroad competition in Ohio: *Bogart* (*Ernest L.*).

AUSTRIA—

Statistische Monatschrift. 1912—

October—Die Rentabilität der Aktiengesellschaften Österreichs: *Ertl* (*Dr. Herbert W.*). Bericht über die Tätigkeit des statistischen Seminars an der Universität in Wien im Wintersemester 1911/12.

November—Wohngrösse und Mietzinshöhe in den hauszinssteuerpflichtigen Orten Österreichs: *Příbram* (*Dr. Karl*). Die Grundlagen zu einer Statistik der motorischen Kräfte in Österreich: *Ried* (*Max*). Studentenstiftungen in den Jahren 1910 und 1911: *Eberstaller* (*Dr. Theodor*).

FRANCE—

Journal des Économistes—

June, 1912—Le 70^e anniversaire de la Société d'Économie politique, et le 90^e anniversaire de M. Frédéric Passy: *Coquet* (*Lucien*). Menaces budgétaires et fiscales: *Guyot* (*Yves*). L'Évolution économique de la République Argentine: *Lafond* (*Georges*).

January, 1913—L'Année 1912: *Guyot* (*Yves*). Le Marché financier en 1912: *Raffalovich* (*Arthur*). L'École autrichienne d'économie politique: *Feilbogen*. Notes sur l'Italie: *François* (*G.*).

FRANCE—*Contd.*

Journal de la Société de Statistique de Paris. January, 1913—Le développement économique, commercial, industriel et financier depuis un siècle, et le mouvement international des marchandises, des capitaux et du crédit: *Neymarck (Alfred)*. Le rôle économique des récoltes: *Guyot (Yves)*. Résultats statistiques du transport des colis postaux sur les réseaux des grandes compagnies de chemins de fer françaises: *Bernard (Jules)*.

La Réforme Sociale. January 1, 1913—La Société d'Économie sociale en 1912: *Lepelletier (F.)*. Auguste Beernaert et son œuvre sociale: *Dejace (Charles)*. La municipalisation des services publics en Italie.—La Loi Giolitti du 29 mars, 1903: *Rizzi (Luigi)*. Le travail à domicile et le contrat collectif: *Bellom (Maurice)*. Le mouvement économique et social—France, Belgique, Grèce: *Lepelletier (F.)*.

GERMANY—

Archiv für Sozialwissenschaft. November, 1912—Verschmelzung und gegenseitige Penetration der Rassen und Nationalitäten Statistische Untersuchungen: *Savornan (Franco)*. Die gegenwärtige Lage der Arbeiter in Japan und das neue Fabrikgesetz: *Kuwata (K.)*. Soziale Fursorge in Japan: *Simon (Dr. Edmund)*. *Jahrbücher für Nationalökonomie und Statistik (Conrad's)*—

November, 1912—Die wirtschaftliche Bedeutung des Erbbaurechtes: *Strehlow*. Die wirtschaftliche Gesetzgebung Oesterreichs im Jahre 1911: *Stowesand (Walther)*. Gewerbe und Handel in Bayern nach der Betriebszählung vom 12. Juni 1907: *Meyer (Maximilian)*. Das Bankkapital und seine Dividende: *Muller-Wernberg (Karl)*. Die Geschäftsergebnisse der deutschen Aktiengesellschaften in den Jahren 1909/10 und 1910/11. Die Geschäftsergebnisse der deutschen Aktienbanken in den Jahren 1907/08, 1908/09, 1909/10 und 1910/11: *Moll (Ewald)*. Kleinwerblicher Kredit: *Crüger (H.)*.

December, 1912—Die wirtschaftliche Gesetzgebung der deutschen Bundesstaaten im Jahre 1911: *Stowesand (Walther)*. Der Einfluss der Immobiliarkreditverfassung auf Bodenpreise und Bodenverschuldung: *Weyermann (M.)*.

January, 1913—Zur Theorie der Statistik: *Wolff (Hellmuth)*. Ueber die neue Staatsversicherung im Grossbritannien und Irland: *Davis (Philip Edgar)*. Die organisatorische und wirtschaftliche Entwicklung im deutschen Brennereigewerbe unter dem Einfluss der Reichsbranntweinsteuergesetzgebung: *Briefs (Goetz)*. Bemerkenswerte Daten aus der bulgarischen Bevölkerungsstatistik: *Haacke (Heinrich)*. Die geographische Verbreitung der kleinen Feuerversicherungsvereine: *Engelbrecht (Th. H.)*.

Vierteljahrshefte zur Statistik des Deutschen Reichs. Heft 4. 1912—Hopfenernte 1912. Die Bergwerke, Salinen und Hutten, 1911. Eheschliessungen, Geburten und Sterbefälle, 1911. Zur deutschen Justizstatistik, 1911. Zur Kriminalstatistik. Vorläufige Mitteilung für 1911. Gemeinden und Wohnplätze von min-

GERMANY—Contd.

Vierteljahrshefte zur Statistik des Deutschen Reichs—Contd.

destens 2,000 Einwohnern (Volkszählung vom 1. Dezember, 1910). Ergebnisse der schulstatistischen Erhebungen von 1911. Der Tabak im deutschen Zollgebiete, 1911. Die Schulbildung der Rekruten, 1911.

Zeitschrift des Königlich Preussischen Statistischen Landesamts, Abteilung 2, 1912—Verbreitung der landwirtschaftlichen Gross-, Mittel- und Kleinbetriebe Preussens über das Staatsgebiet. Nach dem Ergebnis der landwirtschaftlichen Betriebsstatistik von 1907 bearbeitet: *Petersilie (Dr.)*. Das Problem der Preisbewegung und Verbrauchssteigerung in den letzten 40 Jahren. I. England: *Bullod (Carl)*. Haushalt und Haushaltsrechnungen eines holsteinschen Küstenfischers. Ein Beitrag zur heutigen Lage des Ostsee Fischereigewerbes: *Quantz (B.)*.

Zeitschrift für Socialwissenschaft. December, 1912—Ursachen und Triebkräfte der Privatangestelltenbewegung: *Jahn (Georg)*. Die Entwicklung der Handelsbeziehungen. Kanadas zu den Vereinigten Staaten mit besonderer Berücksichtigung Englands. V: *Schultze (E.)*. Arbeitslohn und Produktionstechnik in der Heimarbeit. II: *Schmidt (Erh.)*. Zur Kritik der Marschen Werttheorie: *Behrend (R.)* and *Voigt (A.)*.

ITALY—

Giornale degli Economisti, 1912—

October—Le comunicazioni ferroviarie e l'attuale momento economico in Cina: *Benedetti (U. de)*. Monografia di famiglia del contadino giornaliero in Sicilia nell'anno colonico 1904-05: *Baglio (G.)*. Esame critico delle fonti statistiche dell'emigrazione italiana: *Coletti (F.)*.

November–December—L'azione recente dell'oro sui prezzi generali delle merci: *Benini (R.)*. Interferenze e gettito delle imposte sugli incrementi di valore: *Griziotti (B.)*. Italia e Francia e le Ferrovie Transahariane: *Amoroso (L.)*. La preparazione di un censimento: *Fornasuci Di Verce (Ettore)*.

MONTHLY LIST OF ADDITIONS TO THE LIBRARY.

During the period that has elapsed since January 8, 1913, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

(a) Foreign Countries.

Austria—

Census. Ergebnisse der Volkszählung vom 31. Dezember 1910. Heft 1. Heimatsrechtsverhältnisse. Fol. 1912. (The I. and R. Central Statistical Commission.)

Die Gewerbegeossenschaften und deren Verbände. Kataster der Gewerbegeossenschaften und deren Verbände in Oberösterreich und Salzburg. 1 Abteilung. 2 Band. Svo. 1912. (The Ministry of Commerce.)

Denmark—

Municipal Finance. Comptes communaux et de Ports, 1905-6—1909-10. 4to. 1912. (The State Statistical Bureau.)

France—

Births, &c. Statistique du Mouvement de la Population. Nouvelle Série. Tome 1. Années 1907-10. Svo. 1912. (The Chief of General Statistics of France.)

Paris. Recueil de Statistique Municipale. 1912. 3^e Année. No. 4. De la mortalité et des causes de mort par profession. 186 pp., Svo. 1912. (Dr. J. Bertillon.)

Germany—

Frankfort a.M. Graphisch-Statistischer Atlas von Frankfurt am Main. Serie 1. Tafel 1 bis 10 (Bevölkerung) nebst Stadtplan. 1903. Serie 2 (Schluss). Tafel 1 bis 10. 1911-12. 2 atlases. 1912. (The Municipal Statistical Bureau.)

Italy—

Justice. Atti della Commissione di Statistica e Legislazione. Relazioni e Verbalì delle Discussioni della Sessione del Dicembre 1910, and Luglio 1911. 2 vols., Svo. 1912. (The Ministry of Justice.)

Luxembourg—

Livestock. Der Viehstand des Grossherzogtums nach der Viehzählung vom 10. Dezember 1910. Svo. 1912. (The Statistical Bureau.)

Mexico—

Boletín de la Dirección General de Estadística. Número 1. Fol. 1912. (The Director-General of Statistics.)

Boletín demográfico de la República Mexicana, 1904. Año ix. No. 9. Svo. 1911. (*Id.*)

Sweden—

Labour. Les Lock-out et la grève générale en Suède en 1909. Svo. 1912. (His Excellency the Swedish Minister.)

United States—

Census, 1910. Bulletin. Agriculture: United States. Abstract. Live Stock Products and Domestic Animals Sold or Slaughtered on Farms, by States. 16 pp., 4to. 1913. (The Bureau of the Census.)

— Bulletin. Agriculture: United States. Abstract. Tenure, Mortgage Indebtedness, Colour and Nativity of Farmers, and Size of Farms, by States. 24 pp., 4to. 1913. (*Id.*)

(a) Foreign Countries—*Contd.***United States—*Contd.***

Labour. Care of tuberculous wage-earners in Germany. Bull. U.S. Bureau of Labor. Whole No. 101. Workmen's Insurance and Compensation Series, No. 1. Svo. 1912. (The Department of Commerce and Labor.)

— Report on condition of women and child wage-earners in the United States. Vol. 13. Infant mortality and its relation to the employment of mothers. Svo. 1912. (*Id.*)

Iowa. Labour. 15th Report of Bureau of Labor Statistics for the Biennial Period 1910-11. Svo. 1912. (The Bureau.)

Massachusetts—

Labour. Report of Commission on Compensation for Industrial Accidents. July 1, 1912. Svo. 1912. (The Bureau of Statistics.)

Report of Commission on Old Age Pensions, Annuities and Insurance. January 1910. Svo. 1910. (Mr. F. L. Hoffman.)

New York Academy of Medicine. Quarantine in Maritime Cities of United States, by the Public Health Committee of the Academy. 20 pp., Svo. 1913. (The Academy.)

Philadelphia Commercial Museum. Manufacturing in Philadelphia 1683-1912. By John J. Macfarlane. 97 pp., Svo. 1912. (The Museum.)

(b) India and Colonies.

India, British.

Census of India, 1911. Vol. vii, Bombay. Part 1, Report. Part 2, Imperial Tables. 2 vols., fol. 1912. (The India Office.)

— Vol. viii, Bombay (Town and Island). Parts 1 and 2, Report and Tables. Fol. 1912. (*Id.*)

— Vol. xxi, Mysore. Part 1, Report. Part 2, Tables. 2 vols., fol. Bangalore, 1912. (*Id.*)

Eastern Bengal District Gazetteers. Dacca and Dinapur. 2 vols., Svo. Allahabad, 1912. (*Id.*)

Burma Gazetteer. The Blamo and Lower Chindwin Districts. 2 vols., Svo. Rangoon, 1912. (*Id.*)

— Gazetteer. Myitkyina and Sandoway Districts. 2 vols., Svo. Rangoon, 1912. (*Id.*)

— Gazetteer. Hill District of Arakan, Sandoway and Tharrawaddy Districts, including Town and Village Census Tables. Vol. B. 3 vols., Svo. Rangoon, 1912. (*Id.*)

Australia, Commonwealth of—

Labor and Industrial Branch. Report No. 1. Prices, Price Indexes, and Cost of living in Australia. By G. H. Knibbs. Dec., 1912. 96 + lxii pp., Svo. 1912. (The Author.)

Ashanti—

Returns of Native Population in Towns and Villages of the Colony, and of the Districts of Ashanti. 38 pp., fol. Accra, 1912. (The Colonial Office.)

Ceylon—

Census of Ceylon, 1911. Occupation statistics. Fol. 1912. (The Colonial Office.)

Union of South Africa —

Census, 1911. Annexures to General Report. Part 5, Occupations of the people. Part 6, Religions of the people. Fol. 1912. (The Director, Census Office, Pretoria.)

(c) United Kingdom and its several Divisions.

United Kingdom—

Divorce. Report of Royal Commission on Divorce and Matrimonial Causes. [Cd-6478.] 1912. (Purchased.)

(c) **United Kingdom and its several Divisions—Contd.****United Kingdom—Contd.**

- Education. Special reports on educational subjects. Vol. 27. The teaching of mathematics in the United Kingdom. Part 2. Svo. 1912. (Purchased.)
- Factories. Report of inquiry on Dupuytren's Contraction as a disease of occupation, with special reference to its occurrence among Minders of Lace Machines. Fol. 1912. (*Id.*)
- Report on Conferences between Employers, Operatives, and Inspectors concerning Fencing of Machinery, Prevention of Accidents, and Temperature in Cotton Spinning Mills. Fol. 1912. (*Id.*)
- Finance. Government of Ireland Bill. Further Memorandums on Financial Provisions. [Cd-6486.] 1912. (*Id.*)
- Employment of Government Savings Banks' Deposits. Statement showing how Deposits in Government Savings Banks in certain Foreign Countries and British Possessions are employed. [Cd-6300.] Fol. 1912. (*Id.*)
- Housing and Town Planning. Further Memorandum of Local Government Board relative to Operation of Housing, Town Planning Act, 1909, and earlier Housing Acts as Amended by that Act. [Cd-6494.] Fol. 1912. (*Id.*)
- Mercantile Marine. Return of Number, Ages, Ratings, and Nationalities of Seamen employed on April 3, 1911, on Vessels registered, under Part 1 of Merchant Shipping Act, 1894, in the British Islands. [Cd-6442.] 1912. (*Id.*)
- Steam boilers. Memorandum on Steam boilers. Fol. 1912. (*Id.*)

Scotland—

- Census of Scotland, 1911. Report on the Twelfth Decennial Census of Scotland. Vol. 1. Counties of Renfrew, Ross and Cromarty, Roxburgh, Selkirk, Shetland. (The Registrar-General.)

(d) **Authors, &c.**

- Bellon (Maurice)*. La Législation belge d'assurance contre l'invalidité (Loi du 5 Mai, 1912). 22 pp., svo. 1913. (A. Rousseau.)
- Blackman (William F.)*. The Increasing Cost of Living; its Causes and Cure. 11 pp., sm. svo. 1912. (Prof. Irving Fisher.)
- Bornträger (Dr. J.)*. Der Geburtenrückgang in Deutschland, seine Bewertung und Bekämpfung. Auf Grund amtlichen und ausseramtlichen Materials. 168 pp., svo. Berlin, 1912. (Purchased.)
- Chiozza-Money (L. G., M.P.)*. Money's Fiscal Dictionary. Svo. 1910. (*Id.*)
- Dicksee (Lawrence R.)*. Depreciation, Reserves, and Reserve Funds. "The Accountant's Library." Vol. xxvi. 3rd edition. 80 pp., svo. 1912. (Gee and Co.)
- Dittmann (Dr. Pankraz)*. Die Bevölkerungsbewegung der deutschen Grossstädte seit der Gründung des Deutschen Reichs . . . 153 + 72 pp., svo. Bamberg, 1912. (S. Mahlmeister.)
- Ferraris (Carlo F.)*. Stranieri iscritti nel sessennio scolastico dal 1906-07 al 1911-12, e Laureati e Diplonati nel sessennio scolastico dal 1905-06 al 1910-11, nelle Università e negli Istituti Superiori Italiani. 9 pp., svo. Venezia, 1912. (The Author.)
- Finizio (Prof. Gaetano)*. Relazione sulla Tutela del Lattante (Società Pediatrica Italiana). 49 pp., svo. Padova, 1912. (*Id.*)
- Fisher (Irving)*—
 A more stable Gold Standard. 7 pp., svo. London, 1912. (*Id.*)
 Is the High Cost of Living going Higher. 21 pp., svo. New York, 1912. (*Id.*)
 Revised Estimate of Economic Cost of Tuberculosis. 19 pp., svo. 1912. (*Id.*)
- Glutsky (E. E.)*. Theory of Correlation and Frequency Curves. (In Russian). 210 pp., svo. St. Petersburg, 1912. (*Id.*)
- Henry (Robert)*. Who Pays? An inquiry into the real incidence of Taxation. 76 pp., svo. 1912. (George Allen and Co.)
- Holmes (Arthur)*. Conservation of the Child. A manual of Clinical Psychology presenting the examination and treatment of backward children. 345 pp., svo. Philadelphia and London, 1912. (J. B. Lippincott.)

(d) **Authors, &c.—Contd.**

Leake (P. D.). The Use and Misuse of the Sinking Fund. 19 pp., Svo. London, 1912. (The Author.)

Manes (Alfred). Versicherungswesen. Zweite, umgearbeitete und erweiterte Auflage. xiv + 485 pp., Svo. Leipzig, 1913. (B. G. Teubner.)

March (Lucien)—

Fertilité des Mariages suivant la profession et la situation sociale. 18 pp., Svo. 1913. (The Author.)

Traitement statistique des mesures mentales. 50 pp., Svo. Paris, 1912. (*Id.*)

Prentice (Archibald). History of the Anti-Corn-Law League. 2 vols. Svo. 1853. (Purchased.)

Raper (Charles Lee). Railway Transportation. A history of its economics and of its relation to the State. ix + 331 pp., Svo. New York and London, 1912. (*Id.*)

Ripley (William Z., Ph.D.). Railroads Rates and Regulation. xviii + 659 pp., Svo. 1913. (Longmans, Green and Co.)

Rosenraad (C.). Table comparing Gold and Silver Stock of principal European Banks of Issue, their Bank Rate, Rate of Exchange on London, and Price of different Government Stocks at end of December, 1911, and end of December, 1912. Sheet, fol. 1912. (The Compiler.)

Segall (Dr. Jakob). Die beruflichen und sozialen Verhältnisse der Juden in Deutschland. 86 pp., Svo. Berlin, 1912. (Max Schildberger.)

Watson (Alfred William). Friendly Society Finance considered in its Actuarial Aspect. A course of lectures delivered at the Institute of Actuaries during the session 1911-12. 132 pp., Svo. 1912. (C. and E. Layton.)

Williams (Orlo). Lamb's Friend the Census-Taker. Life and Letters of John Rickman. xi + 330 pp., Svo. London, 1912. (Purchased.)

An Encyclopædia of Industrialism. Nelson's Encyclopædie Library. 543 pp., sm. Svo. 1913. (T. Nelson and Sons.)

London School of Economics. Bulletin of the British Library of Political Science. No. 1. January, 1913. 28 pp., Svo. 1913. (The Hon. W. Pember Reeves.)

Mathieson's Highest and Lowest Prices. 1913 issue. La. Svo. 1913. (Messrs. F. C. Mathieson and Sons.)

Trade of United Kingdom, 1912-1911-1910.—Declared Real Value (Ex-duty) of Imports at Port of Entry, and therefore including Freight and Importer's Profit; and the Distribution of Exports of British and Irish Produce and Manufactures from the United Kingdom, according to their Declared Real Value.

Merchandise (excluding Gold and Silver) Imported from, and Exported to, the following Foreign Countries, &c.	[000's omitted.]					
	1912.		1911.		1910.	
	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to
	£	£	£	£	£	£
Russia { Northern ports..... " Southern ,, }	40,564,	13,767,	43,136,	13,542,	43,618,	12,405,
Sweden	13,231,	7,132,	11,925,	6,355,	11,834,	6,699,
Norway	6,905,	5,570,	6,259,	4,852,	6,631,	4,035,
Denmark*	22,120,	5,591,	20,577,	5,310,	19,463,	5,436,
Germany†	70,074,	40,377,	63,306,	39,357,	61,845,	36,922,
Holland	21,440,	14,305,	18,674,	13,137,	18,533,	12,711,
Java	5,143,	5,142,	4,653,	4,544,	3,034,	3,408,
Belgium†	23,634,	12,246,	20,819,	11,376,	19,361,	10,866,
France†	45,490,	25,608,	41,636,	24,321,	44,298,	22,500,
Portugal†	2,834,	3,040,	2,880,	2,801,	3,097,	2,873,
Spain†	14,558,	6,894,	13,717,	5,500,	13,931,	4,890,
Italy†	8,236,	14,022,	6,950,	13,276,	6,459,	12,552,
Austria-Hungary	7,019,	4,929,	6,917,	4,686,	7,516,	3,996,
Greece	2,118,	2,568,	2,274,	1,726,	2,252,	1,545,
Roumania	3,262,	2,931,	6,595,	2,691,	3,185,	1,827,
Turkey (European and Asiatic) and Crete	6,417,	8,160,	5,493,	9,457,	4,669,	8,635,
Egypt	25,783,	9,461,	21,487,	10,320,	21,005,	8,721,
Philippine Islands and Guam	2,159,	1,108,	1,840,	996,	1,659,	1,172,
China‡	4,952,	10,739,	4,898,	12,149,	5,530,	9,178,
Japan§	3,940,	12,192,	3,388,	11,884,	4,326,	10,110,
United States { Atlantic..... Pacific }	131,607,	30,123,	122,701,	27,433,	117,620,	31,418,
Peru	3,298,	1,414,	3,150,	1,387,	3,688,	1,319,
Chile	4,983,	6,165,	4,348,	6,151,	5,206,	5,464,
Brazil	9,382,	12,640,	10,841,	11,928,	17,506,	16,438,
Argentine Republic	40,808,	20,567,	27,293,	18,616,	28,937,	19,088,
Other countries	35,887,	33,680,	31,411,	31,667,	32,611,	29,064,
<i>Total—Foreign Countries...</i>	<i>558,844,</i>	<i>310,374,</i>	<i>509,198,</i>	<i>295,462,</i>	<i>507,845,</i>	<i>283,272,</i>
BRITISH POSSESSIONS.						
Channel Isles	1,778,	1,335,	1,739,	1,286,	1,593,	1,284,
Nigerian Protectorate	3,235,	3,577,	2,809,	3,059,	3,243,	2,888,
Cape of Good Hope	8,660,	9,892,	7,314,	8,453,	7,736,	8,079,
British India (including Burmah)	52,165,	57,626,	45,445,	52,292,	42,811,	46,003,
Straits Settlements (includ- ing Malay States)	18,209,	5,887,	14,594,	5,021,	13,096,	4,565,
Ceylon	7,498,	2,862,	6,760,	2,522,	5,985,	2,322,
Australia	36,120,	34,865,	39,096,	30,813,	38,656,	27,631,
New Zealand	20,303,	10,382,	17,852,	9,818,	20,942,	8,629,
Canada	26,881,	23,512,	24,596,	19,712,	25,641,	19,683,
British West Indies (includ- ing Bahamas)	1,925,	2,592,	1,923,	2,686,	2,347,	2,434,
Other Possessions	9,288,	24,530,	9,233,	23,159,	8,542,	23,800,
<i>Total—British Possessions</i>	<i>186,053,</i>	<i>177,060,</i>	<i>171,361,</i>	<i>158,821,</i>	<i>170,595,</i>	<i>147,318,</i>
Total — Foreign Countries and British Possessions	744,897,	487,434,	680,559,	454,283,	678,440,	430,590,

* Including Faroë Islands.

† Excluding Colonies.

‡ Excluding Hong Kong, Macão, and Wei-hai-Wei.

§ Including Formosa.

Trade of United Kingdom, for the Years 1912-1907.—*Declared Value of the Total Exports of Foreign and Colonial Produce and Manufactures from the United Kingdom to each Foreign Country and British Possession.*

Merchandise Exported to the following Foreign Countries, &c.	[000's omitted.]					
	1912.	1911.	1910.	1909.	1908.	1907.
Russia { Northern ports } { Southern " }	£ 7,992,	£ 8,806,	£ 8,956,	£ 7,383,	£ 7,345, 513,	£ 7,312, 604,
Sweden and Norway	1,439,	1,626,	1,592,	1,314,	1,342,	{ 1,090, 445,
Denmark*	621,	564,	547,	531,	518,	629,
Germany†	19,223,	18,075,	17,913,	14,920,	13,001,	15,374,
Holland†	5,095,	4,722,	5,143,	4,484,	4,291,	5,039,
Java	31,	37,	23,	24,	22,	18,
Belgium	7,361,	7,252,	6,903,	5,872,	5,413,	6,487,
France†	12,007,	11,159,	11,065,	9,645,	9,506,	10,001,
Portugal†	594,	584,	562,	455,	539,	614,
Spain†	790,	572,	524,	495,	502,	786,
Italy†	999,	1,383,	1,925,	1,133,	1,010,	1,130,
Austria-Hungary	1,219,	1,348,	1,118,	807,	758,	786,
Greece	35,	47,	29,	32,	41,	57,
Roumania	91,	79,	54,	32,	48,	48,
Turkey (European and Asiatic) and Crete	221,	265,	195,	180,	201,	261,
Egypt	153,	147,	166,	160,	215,	209,
Philippine Islands and Guam†	45,	35,	36,	28,	27,	36,
China ‡	113,	126,	149,	110,	75,	109,
Japan §	240,	257,	272,	267,	227,	213,
United States	34,583,	28,560,	30,748,	29,423,	21,177,	27,117,
Peru	115,	100,	119,	115,	144,	187,
Chile	349,	333,	326,	319,	223,	409,
Brazil	511,	451,	387,	306,	277,	304,
Argentine Republic	774,	717,	624,	499,	536,	476,
Other countries	2,773,	2,386,	2,309,	2,196,	1,741,	2,061,
<i>Total to Foreign Countries...</i>	<i>97,374,</i>	<i>89,631,</i>	<i>91,712,</i>	<i>80,730,</i>	<i>69,752,</i>	<i>81,845,</i>
BRITISH POSSESSIONS.						
Channel Islands	284,	241,	249,	248,	239,	226,
Nigerian Protectorates	291,	262,	244,	222,	236,	174,
Cape of Good Hope	957,	872,	821,	677,	843,	882,
Brit. India (including Burma)	2,148,	1,616,	1,030,	1,116,	1,416,	1,209,
Straits Settlements (includ- ing Malay States)	147,	124,	117,	73,	78,	68,
Ceylon	122,	103,	135,	92,	94,	89,
Australia	3,448,	3,655,	3,412,	3,205,	2,720,	3,054,
New Zealand	795,	793,	751,	729,	746,	710,
Canada	3,789,	3,007,	2,945,	2,379,	1,967,	2,122,
British West Indies (includ- ing Bahamas)	398,	459,	470,	367,	378,	373,
Other Possessions	2,085,	1,957,	1,890,	1,527,	1,197,	1,170,
<i>Total to British Possessions</i>	<i>14,464,</i>	<i>13,089,</i>	<i>12,064,</i>	<i>10,635,</i>	<i>9,914,</i>	<i>11,127,</i>
<i>Total to British Possessions } and Foreign Countries }</i>	<i>111,838,</i>	<i>102,720,</i>	<i>103,776,</i>	<i>91,365,</i>	<i>79,666,</i>	<i>91,972,</i>

* Including Faröe Islands, Iceland and Greenland.

† Excluding Colonies.

‡ Excluding Hong Kong, Wei-hai-Wei and Macão.

§ Including Formosa.

FOREIGN EXCHANGES.—*Quotations as under, LONDON on Paris, Hamburg, Calcutta, and New York and Hong Kong, on LONDON, for 1912.*

1	2	3	4	5		6	7	8	9		10			
DATES. (Tuesdays or nearest Dates.)	London on Paris.	London on Berlin.	London on Vienna.	Calcutta.		New York on London.	Hong Kong on London.	Price per Ounce.		Standard Silver in Bars.				
				London on Calcutta.	Indian Council Bills. Minimum Price per Rupee.			Gold Bars (Fine).						
											Demand.	60 d. s.*	4 m. d.†	
1912.	Cheques.	3 m. d.	3 m. d.	s.	d.	s.	d.	\$	s.	d.	s.	d.		
Jan. 2	25·20	20·70	24·12	1	4 $\frac{5}{32}$	1	4 $\frac{1}{16}$	4·83 $\frac{3}{4}$	1	10 $\frac{3}{8}$	77	9	2	1 $\frac{1}{8}$
„ 16	25·20	20·70	24·13	1	4 $\frac{5}{32}$	1	4 $\frac{3}{32}$	4·83 $\frac{3}{4}$	1	10 $\frac{3}{8}$	77	9	2	1 $\frac{9}{16}$
„ 30	25·23 $\frac{1}{4}$	20·69	24·43	1	4 $\frac{5}{32}$	1	4 $\frac{3}{32}$	4·84 $\frac{1}{2}$	1	11 $\frac{1}{4}$	77	9	2	2 $\frac{3}{4}$
Feb. 13	25·25	20·71	24·44	1	4 $\frac{5}{32}$	1	4 $\frac{3}{32}$	4·84 $\frac{1}{2}$	2	0	77	9	2	3 $\frac{13}{16}$
„ 27	25·23 $\frac{3}{4}$	20·70	24·42	1	4 $\frac{5}{32}$	1	4 $\frac{3}{32}$	4·84 $\frac{1}{2}$	1	11 $\frac{3}{16}$	77	9	2	2 $\frac{5}{16}$
Mar. 12	25·23 $\frac{1}{4}$	20·73	24·47	1	4 $\frac{5}{32}$	1	4 $\frac{3}{32}$	4·84 $\frac{1}{2}$	1	11	77	9	2	2 $\frac{15}{16}$
„ 26	25·23 $\frac{1}{4}$	20·72	24·47	1	4 $\frac{5}{32}$	1	4 $\frac{3}{32}$	4·84 $\frac{1}{2}$	1	11 $\frac{1}{8}$	77	9	2	2 $\frac{13}{16}$
Apl. 9	25·23 $\frac{1}{4}$	20·70	24·45	1	4 $\frac{3}{32}$	1	4 $\frac{1}{32}$	4·84 $\frac{1}{2}$	1	11 $\frac{1}{4}$	77	9	2	2 $\frac{7}{8}$
„ 23	25·22 $\frac{1}{2}$	20·70	24·45	1	4 $\frac{3}{32}$	1	4 $\frac{1}{32}$	4·84 $\frac{1}{2}$	1	11 $\frac{7}{8}$	77	9	2	3 $\frac{5}{16}$
May 7	25·22 $\frac{1}{2}$	20·68	24·43	1	4 $\frac{3}{32}$	1	4 $\frac{1}{32}$	4·84 $\frac{1}{4}$	1	11 $\frac{7}{8}$	77	9	2	3 $\frac{11}{16}$
„ 21	25·23 $\frac{1}{4}$	20·69	24·44	1	4 $\frac{1}{16}$	1	4	4·84 $\frac{1}{2}$	2	0	77	9	2	4 $\frac{1}{4}$
June 4	25·22 $\frac{1}{2}$	20·68	24·44	1	4 $\frac{1}{16}$	1	4 $\frac{1}{32}$	4·84 $\frac{3}{8}$	1	11 $\frac{15}{16}$	77	9	2	3 $\frac{15}{16}$
„ 18	25·22 $\frac{1}{2}$	20·68	24·44	1	4 $\frac{3}{32}$	1	4 $\frac{1}{32}$	4·85	2	0 $\frac{5}{16}$	77	9	2	4 $\frac{3}{16}$
July 2	25·21 $\frac{1}{4}$	20·68	24·44	1	4 $\frac{3}{32}$	1	4 $\frac{1}{32}$	4·85	2	0 $\frac{1}{16}$	77	9	2	4 $\frac{3}{16}$
„ 16	25·23 $\frac{3}{4}$	20·67	24·44	1	4 $\frac{3}{32}$	1	4 $\frac{1}{32}$	4·84 $\frac{3}{4}$	1	11 $\frac{3}{16}$	77	9	2	3 $\frac{1}{4}$
„ 30	25·23 $\frac{1}{4}$	20·68	24·43	1	4 $\frac{1}{16}$	1	4	4·84 $\frac{1}{2}$	1	11 $\frac{3}{8}$	77	9	2	3 $\frac{13}{16}$
Aug. 13	25·26 $\frac{1}{4}$	20·70	24·42	1	4 $\frac{1}{16}$	1	4 $\frac{1}{32}$	4·84 $\frac{1}{4}$	2	0	77	9	2	4 $\frac{1}{8}$
„ 27	25·26 $\frac{1}{4}$	20·69	24·43	1	4 $\frac{1}{16}$	1	4 $\frac{1}{32}$	4·84 $\frac{1}{2}$	2	0	77	9	2	4 $\frac{9}{16}$
Sept. 10	25·27 $\frac{1}{2}$	20·70	24·45	1	4 $\frac{1}{16}$	1	4 $\frac{1}{32}$	4·83 $\frac{3}{4}$	2	0 $\frac{1}{16}$	77	9	2	4 $\frac{7}{8}$
„ 24	25·27 $\frac{1}{2}$	20·70	24·45	1	4 $\frac{3}{32}$	1	4 $\frac{1}{32}$	4·82 $\frac{1}{2}$	2	0 $\frac{9}{16}$	77	9	2	5 $\frac{3}{8}$
Oct. 8	25·27 $\frac{1}{2}$	20·71	24·47	1	4 $\frac{3}{32}$	1	4 $\frac{1}{32}$	4·82 $\frac{1}{4}$	2	0 $\frac{11}{16}$	77	9	2	5 $\frac{9}{16}$
„ 22	25·22 $\frac{1}{2}$	20·76	24·52	1	4 $\frac{3}{32}$	1	4 $\frac{1}{16}$	4·81 $\frac{7}{8}$	2	0 $\frac{1}{8}$	77	9	2	5 $\frac{3}{16}$
Nov. 5	25·21 $\frac{1}{4}$	20·80	24·56	1	4 $\frac{3}{32}$	1	4 $\frac{1}{32}$	4·81 $\frac{3}{4}$	2	0 $\frac{11}{16}$	77	9	2	5
„ 19	25·22 $\frac{1}{2}$	20·80	24·58	1	4 $\frac{3}{32}$	1	4 $\frac{1}{32}$	4·80 $\frac{1}{2}$	2	0 $\frac{13}{16}$	77	9	2	5 $\frac{1}{16}$
Dec. 3	25·21 $\frac{1}{4}$	20·78	24·59	1	4 $\frac{1}{2}$	1	4 $\frac{1}{16}$	4·80 $\frac{1}{2}$	2	0 $\frac{1}{2}$	77	9	2	5 $\frac{9}{16}$
„ 17	25·21 $\frac{1}{4}$	20·78	24·60	1	4 $\frac{3}{32}$	1	4 $\frac{1}{32}$	4·81	2	0 $\frac{5}{16}$	77	9	2	5 $\frac{1}{4}$
„ 31	25·16 $\frac{1}{4}$	20·75	24·56	1	4 $\frac{3}{32}$	1	4 $\frac{1}{16}$	4·81 $\frac{1}{2}$	2	0 $\frac{5}{16}$	77	9	2	4 $\frac{1}{16}$

* Wednesdays following.

† Fridays following.

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JOURNAL
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*The PANAMA CANAL and COMPETITION for TRADE in LATIN
AMERICA, the ORIENT and AUSTRALASIA.*

By Professor LINCOLN HUTCHINSON (of the University of California).

[Read before the Royal Statistical Society, February 18, 1913,
the President, Professor F. Y. EDGEWORTH, M.A., F.B.A., in the Chair.]

It has been officially announced that the Panama Canal will be formally opened for business some time during the year 1915, and the thoughts of commercial people the world over are turning definitely towards the results which are likely to follow the completion of this great enterprise.

That the effects will be profound there can be no doubt, yet their importance can easily be exaggerated. The changes in trade routes, while of immense significance to certain countries, will by no means be as fundamental as those wrought by the opening of the Suez Canal. The cutting of the isthmus joining Africa with Asia caused a complete revolution in the commercial relations between Europe and the whole Oriental world. The saving of distance by the new route was so vast that practically the whole traffic between the two great sections of the huge Eurasian continent, with its more than 1,200 millions of people, three-quarters of the population of the globe, flowed through the new channel. With Panama, the case is very different. To many of the most important parts of the globe the new canal will merely open an alternative route; to several others, it will offer no advantages whatever and their trade will cling to its present routes. Exactly what the changes will be it is, of course, impossible to predict, for the factors which will determine the choice of routes will be numerous and complex. Mere saving of distance will be but one determinant. Others will be the presence or absence of favourable ocean currents and weather conditions, intervals between coaling stations and ports of call, cost of fuel at those stations, the amount of way freight

business available by different routes, relative insurance rates, &c., and only experience can determine the precise effects of the various combinations of these many factors.

Certain salient facts, however, do stand out. The two seaboard of the United States are so related to one another that the canal must of necessity carry a large part of the traffic between them. Goods passing, for example, from the manufacturing centres of New York, New England, or Pennsylvania, will have a choice between a 5,200-mile all-sea route and a 3,000 to 3,500-mile all-land route with mountain passes ranging from 5,000 to 8,000 feet in elevation. In the main, it is obvious that all but the lightest and most costly classes of goods must choose the all-sea route. Similarly, traffic between Europe and Eastern Canada and the entire West Coast of North America, from Central America to Alaska, will effect so great a saving by using the canal, that this route must, in general, be adopted. The same is true, though to a somewhat less extent, of trade from Europe, the Eastern United States and Eastern Canada, to the West Coast of South America. In this case, however, the alternative routes, *i.e.*, the present routes *via* Cape Horn or Magellan Straits, will still offer more or less effective competition. With the canal toll fixed at \$1.20 per net registered ton, as at present, most of the traffic with Ecuador and the Pacific Coast of Colombia will probably use the canal. Trade with Peru, and to a much greater extent with Chile, will probably divide itself in proportions at present indeterminable, between the two routes.

On the western shores of the Pacific the problem is much more complex. India will clearly be beyond the zone of influence of the new canal; Singapore and East India Islands may feel slight indirect effects. The Philippine Islands, China, and Japan will in general be beyond the reach of the canal's influence so far as trade with Europe is concerned, though they will all become to some extent, at least, more accessible to the great commercial centres of the Eastern United States.¹

The islands of the Pacific generally will come well within the influence of the canal, but Australia and New Zealand will occupy a position very similar to that of China, Japan, and the Philippines.

¹ A ten-knot freighter, for example, plying between Liverpool and Singapore, would lose 28.4 days by choosing the Panama route; to Manila the loss would be 17.9 days; to Hong Kong, 16.8; to Shanghai, 11; and to Yokohama, 2.4. A similar vessel from New York would lose 9.8 days by choosing the Panama route to Singapore, would gain 7.3 days in going to Shanghai, and 15.2 days in going to Yokohama. Manila and Hong Kong would be practically equi-distant by either route. See *Panama Traffic and Tolls*, by E. R. Johnson, special Commissioner on Panama Traffic and Tolls. Washington, Government Printing Office, 1912.

For European ports the new canal will offer no saving of time in the traffic with these countries, except in the case of New Zealand, though other less direct influences may cause some of the trade to seek the new route. Atlantic ports of the United States, however, will be brought very considerably nearer, and, in spite of the fact that distances between coaling stations on the Panama route will be very great, it is likely that much American-Australian trade will seek this route.²

The commercial effects of the opening of the new canal, then, will be those due to the making more accessible to one another of the markets of Europe and the Eastern seaboard of the United States, on the one hand, and those of all countries which border the Pacific Ocean, on the other. In a certain sense the former may be regarded as the "active" factors in the problem, seeking trade; and the latter as the "passive" factors, being traded with. A complete discussion of the probable results of opening the canal would involve an examination of the trade of, and the trade conditions in, all of these countries. For the purposes of the present paper, however, it is proposed to limit the investigation by omitting from consideration the traffic between the two seaboard of the United States, between the two seaboard of British North America, and between Europe and the western coast of the United States, Canada and Alaska. The investigation is confined, then, to trade relations between Europe and the United States (with some reference also to Canada), and Latin America, the Orient and Australasia.

The method to be employed in the investigation is based upon the assumption that commercial activity depends upon certain geographical, social, political and economic factors which determine, to a great extent, the volume and character of trade of different countries; and that all the canal can do will be to facilitate and accentuate developments which have already made themselves apparent, in one way or another, in the regions which will come within its influence. It is proposed, therefore, to examine the commercial activity of these countries during the past ten or fifteen years in the hope of discovering what the trend of development has been. If any well-defined tendencies of growth or decline can be made out, as for instance in the trade in specific classes of goods, or between specific countries, it will be a relatively easy matter to

² Ten-knot vessels from Liverpool would lose 9·7 days by choosing the Panama route to Adelaide, 5·4 days to Melbourne, and 6·2 days to Sydney. To Wellington they would gain 6·0 days. From New York the saving *via* Panama would be 9·9 days to Wellington, 15·8 days to Sydney, 11·0 days to Melbourne, and 6·7 days to Adelaide. Report of E. R. Johnson, above mentioned.

form some judgment as to how the opening of the new trade route will be likely to modify these movements. The method is somewhat analogous to that which might be employed by astronomers in calculating the orbits of heavenly bodies if a newly created planet were to be introduced into the solar system.

The specific countries whose trade is being sought are, in detail: Mexico, Guatemala, Honduras, Salvador, Nicaragua, Costa Rica,³ Colombia, Ecuador, Peru, Bolivia, Chile, China, Japan, the Philippine Islands, New Zealand, and Australia. For the sake of brevity it is proposed to refer to these sixteen countries as the "Canal Countries" throughout the rest of this paper. Minor countries like the more eastern East Indies, Hawaii, Samoa, Tahiti, &c., might properly be included, but their trade is, and must always remain, so insignificant, and their inclusion would introduce so many complex but unimportant details, that it has been thought best to omit them.

Now, these sixteen "Canal Countries" naturally fall into rather definite groups, more or less homogeneous with respect to important geographical, economic, and political conditions. Mexico, the Central American States, and Colombia all possess this in common, that their political and social characteristics are somewhat similar and that, owing to the fact that they front on both oceans,⁴ the results to them of the opening of the canal are apt to be indirect rather than direct. Their trade will be stimulated, not so much because their principal ports will be made more accessible, as because great trade currents will pass near their doors. Mexico, however, differs essentially from others in this group because of its peculiar geographical relations with the United States. The economically most important parts of this country being a high plateau, with difficult approaches to either ocean, but with easy overland access to the great railway systems of the United States, the commercial connection with the latter country is peculiarly close. It seems advisable, therefore, to consider Mexico separately.

The South American countries whose commercial frontage is exclusively on the Pacific, Ecuador, Peru, Bolivia,⁵ and Chile,⁶ may also be treated as a single unit because, in the main, they all fall so definitely within the zone of the canal's influence. At present,

³ Panama is omitted because the canal building operations have introduced so many abnormal features into its trade that little can be learned from an examination of it as to the real tendencies of development.

⁴ Except, of course, Salvador and Honduras.

⁵ Practically all of Bolivia's trade with Europe and North America passes through Chilean or Peruvian ports.

⁶ Only the unimportant Chilean port of Punta Arenas can be said to belong to the Atlantic basin.

without a canal, it is estimated that about 75 per cent. of the freight movement between Ecuador and the United States and Europe uses the Panama route, being transhipped by rail across the isthmus. In Peru the present traffic seems to be about equally divided between the Panama and the Magellan routes. The proportion moving through the Straits of Magellan naturally increases as one goes south along the Chilean coast, until at the southernmost Pacific ports, such as Valdivia, the Panama route disappears as a competitor.⁷

When the canal is completed these proportions will be greatly changed. Ten-knot vessels from Liverpool to Guayaquil will save 21·1 days by choosing the Panama route, to Callao 16·3 days, to Iquique 11·7 days, to Valparaíso, 5·9 days, &c. From New York the saving will be to Guayaquil, 30·3 days, to Callao, 25·5 days, to Iquique, 20·9; to Valparaíso, 15·1, to Coronel, 13·2.⁸ It is safe to say that nearly all the traffic between the Atlantic seaboard of the United States and these West Coast countries will take the Panama route; and that a large part of the European freight movement will follow the same course except that which is destined for southern Chile. The opening of the canal will, therefore, effect so profound a change in the commercial relations of all four of these countries that they may reasonably be treated as a single unit.

China, Japan, and the Philippine Islands while in many respects similar in possessing those social and economic characteristics known as "Oriental" and in lying along the border line between the zones of influence of the Panama and the Suez Canals, yet present so great contrasts in political and commercial development that it seems best to consider them separately. The sudden emergence of Japan from political and economic obscurity into commercial prominence among the nations of the world would alone put her in a different class from her great neighbour on the continent; and the peculiar political and economic relationship which the Spanish-American war brought into being between the Philippine Islands and the United States differentiates that archipelago from both the other Oriental countries mentioned.

New Zealand and Australia, in spite of local contrasts, are sufficiently similar through their possession of an almost exclusively Anglo-Saxon population and through their special economic relationship to England, to make it possible to treat them as a unit.

For the purposes of this paper, therefore, it is proposed to avoid

⁷ See *Report on Trade Conditions in Central America and on the West Coast of South America*. By L. Hutchinson. Washington Printing Office, 1906.

⁸ *Preliminary Report on Panama Traffic and Tolls*, pp. 18 and 19.

a confusing multiplication of statistics by grouping the countries which it is necessary to consider in the manner just indicated. Instead of examining each of the sixteen countries separately, the number is reduced to seven countries and groups of countries, as follows:—1, Mexico; 2, Central America and Colombia; 3, West Coast of South America (excepting Colombia and including Bolivia); 4, China; 5, Japan; 6, British Australasia; 7, the Philippine Islands.

These seven groups of countries, the "passive" countries in the problem of Panama canal trade, comprise a total area of some 11,000,000 square miles, or about one-quarter of the land surface of the globe. Their combined population is 532,000,000, or one-third the population of the earth. Yet their aggregate foreign trade is only 539,000,000*l.*, or less than 40 per cent. of the foreign commerce of the United Kingdom alone. Their *per capita* trade is 1*l.*, that of the United Kingdom over 30*l.* Far more important, however, than contrasts between these countries as a whole, and the "active" countries of Europe and North America, are the differences among the various groups. It is a commonplace that such differences exist, yet their magnitude is not always fully appreciated. Mexico, Central America and Colombia, and the West Coast of South America, are very sparsely populated. Mexico has 20 inhabitants to the square mile; Central America and Colombia 15; the West Coast countries of South America only 6. The Oriental countries present a most violent contrast in this respect; the Philippine Islands support 67 persons to the square mile; the Chinese Empire as a whole, 101; China proper, 266; Japan, 336.

Equally important, as related to economic development, are the differing proportions of population of European origin, for low percentage of population of this sort often, at least, bears some sort of relationship to low commercial activity. Central America and Colombia have but 9 per cent. of European population; Mexico, 19 per cent.; the West Coast of South America, 36 per cent. The figures of their *per capita* foreign trade are 39*s.*, 63*s.*, and 140*s.* respectively. China has 101 per cent. European population; Japan, 101 per cent.; the Philippines, 3 per cent. The respective figures of *per capita* trade are a little over 5*s.*, 37*s.*, and 41*s.*

New Zealand and Australia present a most marked contrast to any of these countries in the extreme sparseness of their population (1·8 per square mile), the high percentage of European population (practically 100 per cent.), and the enormous *per capita* foreign trade (over 31*l.*). Many other important differences between these seven groups might, of course, be pointed out, but enough has been said to illustrate and emphasize the necessity of treating them separately in any examination of probable economic progress or any explanation of past development.

In the present paper we are concerned primarily with the commercial dealings of these groups of countries with Europe and the United States. We may regard them as purchasers of European and American goods, producing certain articles of merchandise with which they can pay for these purchases. We have to ask ourselves what they wish to buy from Europe and America and what they can give in return. The best answer to this double question is to be found in the facts of recent trade, and our first task is to ascertain what these facts are. What are these countries actually exporting and importing to-day, and are there any indications of change in the character of the goods which they sell or purchase?

It is well known that comparisons of trade statistics for single years are apt to lead to very erroneous conclusions. In order to minimise the possibility of error the figures for this paper have been made to cover a period of ten and, in some cases, fifteen years. This period is divided into sub-periods of five years each, and calculations as to rates of growth or decline in any particular trade are based on comparisons of the averages per annum for the five-year periods thus obtained.

The first question is what have these seven groups of countries to export? For convenience, the export goods may be divided into the following classes according to the nature of the industry which produces them: forest, agricultural, animal, mineral and fisheries products.

It is commonly said that none of the countries in question produces any large quantities of manufactured goods. With certain modifications the figures fully confirm this statement. Mexican exports of manufactures for the period 1901-05 made up but 0.9 per cent. of the total exports. In 1906-10, the percentage dropped to 0.2. Central America and Colombia export no manufactures of any consequence, except a few hats from the latter country. Chile's export of manufactures constituted 1.5 per cent. of the total in 1900-04, and 1.1 per cent. in 1905-09. Peru's statistics show a much larger proportion, but only because sugar is included as a manufacture. Excluding sugar, the percentage for 1902-05 is 4.0, and for 1906-09, 3.2. In Australia, the percentages are 3.5 and 4.1 for the two periods 1901-05 and 1906-10 respectively; and for New Zealand, 1.5 and 1.1. 4.4 per cent. of Philippine Islands exports were "manufactures" in 1900-04, and 2.9 per cent. in 1905-08.

In none of these countries, therefore, do manufactures play more than a most insignificant part in the export trade. And few of such manufactured goods as are exported are the product of any highly elaborative industry. Mexico sells cigars and cigarettes, and a few articles of hennequin; Colombia and Ecuador "straw" hats; Peru, about 190,000*l.* worth per annum of hats, cocaine and

cotton goods; Chile, some leather and a little flour; Australia, alcoholic liquors, tobacco manufactures, leather, and a few other items; New Zealand, leather;⁹ the Philippine Islands, cigars and cigarettes. It will be noticed, too, that the export of manufactures from these countries is not only insignificant but is declining in relative importance in all of them except Australia, where there has been a slight increase, from 3.5 per cent. to 4.1 per cent.

With China, and especially with Japan, the case is somewhat different. China's exports of manufactures in 1901-05 were 18.6 per cent. of the total, and in 1906-10, 16.6 per cent. Japan's percentages were larger still, being 33.7 in 1900-04, and 29.9 in 1905-09. There is this difference between the two, however, that while China's manufactures are mainly the product of small domestic industries, such as straw braid, paper, ground-nut oil, "medicines," mats and matting, firecrackers and fireworks, Chinese boots and shoes, and hand-woven silks; Japan's are to a considerable extent the output of factories. Of Japan's total export of manufactures of 11,800,000*l.* per annum for 1905-09, 4,800,000*l.* worth were of cotton yarn and tissues¹⁰ and 3,600,000*l.* worth of silk tissues. Even in Japan, however, there is a relative decline in importance of these exports of manufactures, only one item—cotton yarn and tissues—having held its own throughout the whole ten years under consideration. These goods made up 12.1 per cent. of the total export for 1900-04, and maintained the same percentage for 1905-09. Silks at the same time declined from 12.2 per cent. to 9.2 per cent., and manufactures, as a whole, from 33.7 per cent. to 29.9 per cent.

On the whole, then, it is evident that none of these seven groups of "Canal Countries," with the possible exception of Japan, depends to any important extent upon its manufactures as a means for purchasing foreign goods. Their export goods are mainly the output of the simpler activities which have to do with gathering the products of the forest, the sea, or the mines, or the cultivation of the agricultural or pastoral industries. An indication of the relative importance of these various classes of products is given by the following table.¹¹

⁹ In New Zealand statistics phormium is included under manufactures, but this seems scarcely justifiable.

¹⁰ This export, however, does not go to Europe or America.

¹¹ The Central American States (except Costa Rica), Colombia, Ecuador, and Bolivia are omitted from this table because their official statistics are not available in sufficient fullness to make comparisons accurate. The exports of the Central American States and Colombia are, like those of Costa Rica, mainly agricultural. The same is true of Ecuador, whose chief export is cacao. Bolivia's exports are about 75 per cent. mineral and 25 per cent. forest products, such as rubber and cacao, the total being from 2,500,000*l.* to 3,500,000*l.* per annum.

Annual average exports by classes of products.*

[Values in millions of £'s.]

From	Forest products.		Animal products.		Agricultural products.		Mining products.		Fisheries products.		Manufactures.		Miscellaneous.	
	1st period.	2nd period.	1st period.	2nd period.	1st period.	2nd period.	1st period.	2nd period.	1st period.	2nd period.	1st period.	2nd period.	1st period.	2nd period.
Mexico	0.3	0.3	1.2	1.2	5.0	6.3	9.6	14.3	0.0	0.0	0.16	0.04	1.92	3.38
Costa Rica	0.0	0.0	0.0	0.0	1.5	1.6	0.1	0.2	0.0	0.0	0.00	0.00	0.05	0.05
Chile	0.0	0.0	0.3	0.4	0.4	0.6	12.6	19.2	0.0	0.0	0.22	0.25	1.02	1.85
Peru	0.7	0.9	0.5	0.5	1.4	2.0	0.9	1.0	0.0	0.0	0.18	0.19	0.76	1.23
China	0.0	0.0	11.4	14.2	8.1	12.7	0.0	0.0	0.2	0.2	5.60	7.10	4.70	8.60
Japan	0.8	1.5	7.7	11.3	2.4	2.2	3.1	4.0	0.6	0.8	8.87	11.79	2.86	7.82
Australia	0.9	1.2	21.9	35.4	4.4	8.0	19.8	19.2	0.0	0.0	1.70	2.70	0.10	0.10
New Zealand	0.8	0.9	9.6	14.5	1.4	1.0	2.2	2.4	0.0	0.0	0.21	0.20	0.02	0.03
Philippines	0.0	0.0	0.0	0.0	4.7	6.1	0.8	0.3	0.0	0.0	0.26	0.20	0.30	0.28
Total	3.5	4.8	52.6	77.5	29.3	40.5	49.1	60.6	0.8	1.0	17.20	22.47	11.73	23.34
Percentage of total exports.....	2.2	2.1	32.0	33.7	17.8	17.6	29.9	26.3	0.5	0.4	10.5	9.8	7.1	10.1

* It has been found impossible to get absolute uniformity in regard to the two periods for the various countries; but as the variations are not great, and as the figures are reduced to annual averages, the errors are not important. The two periods are 1900-04 and 1905-09 for Japan and Chile; 1900-04 and 1905-08 for the Philippine Islands; 1903-06 and 1907-10 for Costa Rica; 1901-05 and 1906-10 for Mexico, China, Australia, and New Zealand; and 1902-05 and 1906-09 for Peru. In compiling and classifying the figures only items of £5,000 and over have been included. The aggregate of the smaller items has been included, together with certain unclassified amounts, under the heading "Miscellaneous."

The noteworthy features of the export trade of these countries, as a whole, is the preponderance of animal, agricultural and mining products. Animal products take the first place, mining products are a close second, and agricultural products follow with about one-half the value of the animal products. The figures reveal, also, the important fact that the animal industries are increasing in relative importance, having grown from 32.0 per cent. of the total in the first five-year period to 33.7 per cent. in the second. The agricultural industries remain practically stationary at about 17.5 per cent.; while the mining industries have declined in a ratio which corresponds very closely with the increase in the animal industries.

There are marked contrasts, however, between the different groups of countries. These can best be noted by reducing the figures to percentages of total export as in the table on page 369.

Only in Mexico and Chile do mining products predominate; in the former country reaching over one-half, and in the latter, nearly seven-eighths of the total exports. It is noteworthy that even in Chile the relative importance of the mineral export has declined somewhat, leaving Mexico as the single country in which such exports have increased not only absolutely but relatively.

The only other large exporter of minerals is Australia, but here these exports, which in the first five-year period were almost equal in importance to the animal export products (40.6 per cent. and 44.9 per cent. respectively) have fallen relatively to such an extent that in the second period their volume is only a little over one-half as large as the animal exports (28.8 per cent. and 53.2 per cent. respectively).

Only in Central America, Colombia, Ecuador, Peru and the Philippine Islands, do agricultural products play the leading part, and even in these countries the aggregate value is small. Peru's exports of this sort amount to about 2,000,000*l.* per annum, a slight increase in relative importance between the two periods (from 32.6 per cent. of the total exports to 34.2 per cent.). The chief items are sugar and cotton. Central America, Colombia and Ecuador export from 7,000,000*l.* to 8,000,000*l.* worth of agricultural goods made up chiefly of such tropical products as bananas, coffee, and cacao. The Philippine exports are classed as agricultural although the use of that term is apt to give a somewhat erroneous impression. Nearly 90 per cent. of the exports are made up of Manila hemp, copra, raw sugar and raw tobacco. While sugar and tobacco may properly be regarded as agricultural, the hemp and copra are only partially the products of systematic cultivation. All of these materials are increasing in relative importance in the export list, having risen from 77.9 per cent. of the total in the first period, to 89.1 per cent. in the second.

*Exports by classes of products.**

[In percentage of total export.]

From	Forest products.		Animal products.		Agricultural products.		Mining products.		Fisheries products.		Manufactures.		Miscellaneous.	
	1st period.	2nd period.	1st period.	2nd period.	1st period.	2nd period.	1st period.	2nd period.	1st period.	2nd period.	1st period.	2nd period.	1st period.	2nd period.
Mexico	1.8	1.0	6.3	4.9	27.6	24.6	52.9	56.1	0.0	0.0	0.9	0.2	10.5	13.2
Costa Rica	1.6	1.2	1.2	1.0	90.4	87.7	5.1	8.4	0.0	0.0	0.0	0.0	1.7	1.7
Chile	0.0	0.0	1.8	2.0	2.6	2.8	87.0	85.8	0.0	0.0	1.5	1.1	7.1	8.3
Peru	15.0	15.6	10.7	8.6	32.6	34.2	20.2	17.4	0.0	0.0	4.0	3.2	17.5	21.0
China	0.0	0.0	38.0	33.3	27.0	29.6	0.0	0.0	0.7	0.5	18.6	16.6	15.7	20.0
Japan	3.0	3.9	29.3	28.7	8.9	5.5	11.7	10.1	2.5	2.0	33.7	29.9	10.9	19.9
Australia	1.8	1.8	44.9	53.2	9.0	12.0	40.6	28.8	0.0	0.0	3.5	4.1	0.2	0.1
New Zealand	5.6	4.5	67.1	76.4	9.9	5.2	15.6	12.5	0.2	0.1	1.5	1.1	0.1	0.2
Philippines	0.0	0.0	0.0	0.0	77.9	89.1	12.7	3.8	0.0	0.0	4.4	2.9	5.0	4.2
All	2.2	2.1	32.0	33.7	17.8	17.6	29.9	26.3	0.5	0.4	10.5	9.8	7.1	10.1

* See footnote, p. 367.

China, Japan, New Zealand and Australia are the only countries in the list in which animal products take first rank among the exports. In the first two, silk is the predominant item; in New Zealand wool, meat, and dairy products in the order mentioned; in Australia wool. In both China and Japan the relative importance of these animal exports is declining, from 29·3 per cent. in the first period to 28·7 per cent. in the second, in Japan; and from 38·0 per cent. to 33·3 per cent. in China. In New Zealand and Australia, on the contrary, there is marked increase in relative value, from 67·1 per cent. to 76·4 per cent. in New Zealand, and from 44·9 per cent. to 53·2 per cent. in Australia.

In Japan and New Zealand, agricultural exports have declined not merely in relation to the total but also in absolute amount. In Japan this is due chiefly to a decline in the foreign sales of rice, and in New Zealand mainly to a falling off in the export of cereals.

The only other countries which export any considerable quantity of agricultural products are Mexico, China, and Australia. In all of these there has been increase in absolute amount, but only in China and Australia a relative increase as well. The chief Mexican sales of this sort are hennequin, coffee and rubber, the two last mentioned showing an increase, but the first, by far the largest single item, showing a decline. Chinese agricultural exports are mainly tea, beans and bean cake, and raw cotton. These all show rapid increase, especially beans and bean cake, which have risen from 1,400,000*l.* in the first period to 3,800,000*l.* in the second.¹² Australia's export of this class is almost wholly of vegetable foodstuffs, which nearly doubled in value between the two periods, amounting now to 7,700,000*l.* per annum. In 1901-05 they made up 9·0 per cent. of the total exports; in 1906-10, 12 per cent.

On the whole, the following conclusions seem to be justified, concerning the purchasing power of the seven groups of "Canal Countries."

1. They are all increasing their output of goods which Europe and America require, their total exports having increased some 36 per cent. between the two five-year periods considered.

2. The chief articles which they find it profitable to produce as a means for purchasing foreign goods are animal, mineral, and vegetable raw and semi-raw materials.

3. On the whole, the products of the animal industries are increasing in relative importance; the vegetable materials remaining relatively almost stationary, and the mineral showing a distinct decline.

4. The greatest latent possibilities of trade development are to

¹² This export, however, goes chiefly to Japan, and cannot therefore be regarded as one of the products used directly for the purchase of European and American goods.

be found to-day in China, Japan, and British Australasia, the total exports from those countries being already nearly three times as large as the combined exports of Mexico, Central America and Colombia, the West Coast of South America and the Philippine Islands.

5. The tendencies of development are toward increasing sales by the seven groups of "Canal Countries" of:—

- a. Animal fibres: wool from Australasia, and to a less extent, silk from China and Japan.
- b. Animal foodstuffs: meat and dairy products from Australasia.
- c. Tropical vegetable products, chiefly foodstuffs: fruit, coffee and cacao from Central America, Colombia and Ecuador.
- d. Certain mineral products: silver from Mexico, nitrate from Chile; with gold from Australia, increasing in absolute, but decreasing in relative importance.

Having now reached some conclusions as to the tendencies in development of products which these "Canal Countries" have to sell, our next step must be to examine the character of their purchases. What do they get in exchange for these commodities?

For convenience, their imports may be divided into three great classes: 1. Those which are destined to supply food to the people; all sorts of foodstuffs, including beverages; 2. Those which clothe them; textiles, ready-made clothing, boots and shoes, &c.; and 3. Those which are used in the development of industries; structural material, machinery, tools and implements, and many general manufactures. Making such a classification and analysing the statistics we find the facts set forth in the following table:—

*Annual average imports by classes of products.**

[Values in millions of £'s.]

Into	Foodstuffs.		Clothing materials, &c.		Industrial and structural materials, &c.		Miscellaneous.	
	1st period.	2nd period.	1st period.	2nd period.	1st period.	2nd period.	1st period.	2nd period.
Mexico	1·2	2·3	2·5	2·8	6·1	8·4	5·0	7·4
Costa Rica	0·2	0·2	0·2	0·3	0·2	0·3	0·5	0·6
Peru	0·4	0·5	1·0	1·2	1·4	1·8	1·3	1·5
Chile	0·7	0·8	1·9	2·5	3·4	7·8	4·5	7·4
China	6·2	10·0	19·9	19·8	8·5	10·2	5·9	15·4
Japan	6·9	6·5	2·4	3·5	16·0	26·5	4·6	8·0
Australia	6·8	6·5	12·2	16·3	17·3	24·3	2·8	4·5
New Zealand	1·4	2·1	2·9	3·8	5·5	7·5	2·2	2·5
Philippines	1·8	1·4	1·8	1·7	0·9	1·1	0·9	0·3
Total	25·6	30·3	44·8	51·9	59·3	87·9	27·7	47·6
Percentage of total imports	16·3	13·9	28·4	23·8	37·7	40·4	17·6	21·9

* See footnote, p. 367.

The significance of this table as a whole is so apparent as to call for but little comment. Not only do the imports of industrial and structural materials exceed any other class of imports but they are rapidly increasing in relative importance. Purchases of foodstuffs have increased 18·4 per cent. and clothing materials 15·9 per cent.; those of industrial and structural materials nearly 50 per cent. (48·2 per cent.). Foodstuffs, which in the first period made up 16·3 per cent. of the total imports, in the second period drop to 13·9 per cent. Similarly imports of clothing materials have fallen from 28·4 per cent. of the total to 23·8 per cent. Industrial and structural materials, on the other hand, have jumped from 37·7 per cent. to 40·4 per cent.

Differences between the various countries must, however, be noted. The following table of percentages indicates the chief features:—

*Imports by classes of product.**

[In percentage of total imports.]

Into	Foodstuffs.		Clothing materials, &c.		Industrial and structural materials, &c.		Miscellaneous.	
	1st period.	2nd period.	1st period.	2nd period.	1st period.	2nd period.	1st period.	2nd period.
Mexico	7·9	11·2	17·1	13·2	41·0	40·0	34·0	35·6
Costa Rica	14·9	16·7	19·4	17·1	18·6	18·5	47·1	47·7
Peru	9·0	10·6	24·4	23·0	35·0	36·7	31·6	29·7
Chile	6·9	4·0	17·4	12·9	31·1	40·6	44·6	42·3
China	12·9	16·4	41·4	32·5	17·7	16·7	28·0	34·4
Japan	23·1	14·5	8·0	7·9	53·2	59·3	15·7	18·3
Australia	17·4	12·6	31·2	31·6	44·2	47·1	7·2	8·7
New Zealand	11·7	13·2	24·2	23·9	45·8	47·2	18·3	15·7
Philippines	26·4	23·4	26·7	28·9	13·2	18·9	33·7	28·8
All	16·3	13·9	28·4	23·8	37·7	40·4	17·6	21·9

* See footnote, p. 367.

In Mexico, the imports of foodstuffs, though smaller than either of the other two classes, have risen nearly 100 per cent., until, in the second period, they almost equal the imports of clothing material. This probably does not, however, represent the normal development in that country, for in general it is well able to feed itself. The interruption of cultivation by the recent succession of civil conflicts has probably been the cause of this apparent anomaly.

The largest purchases of foodstuffs are made by China, Japan, and Australia, but there is this noteworthy difference, that in Australia and Japan the imports have not only declined in absolute, but also in relative amount, constituting 17·4 per cent. of the

imports of the former country in the first period, and only 12.6 per cent. in the second; and in the latter country, 23.1 per cent. and 14.5 per cent. in the two periods respectively; while in China, these imports have increased in both relative and absolute amount, having risen from 12.9 per cent. of the total in the first period to 16.4 per cent. in the second.

The largest item included in Australia's imports of this class is made up of articles which, strictly speaking, are not foodstuffs at all, namely, alcoholic and non-alcoholic beverages; and the decline is probably due to increasing home production. On the whole Australia is, of course, well able to feed itself.

In China and Japan, the situation is quite different. The density of population, 101 to the square mile for the entire Chinese Empire, 266 for China proper, and 336 for Japan, renders impossible the support of a large industrial population on home-grown foodstuffs. Japan furnishes an admirable example of the results, in this respect, of the introduction of great industrial changes. Prior to about 1890, Japan was much like any other agricultural Oriental country, supporting itself mainly with the produce of domestic farms and fisheries. *Per capita* imports of foodstuffs amounted to less than 3*d.* The working energy of the country was so fully employed in getting necessary food that the withdrawal of labour for the development of other industries could not possibly take place until new sources of food supply could be found. The wonderful economic revolution in the country in the past twenty-five years has of necessity been accompanied by enormously increased imports of food. In the five years 1890-94, the average *per capita* imports of this sort,¹³ rose to 3½*d.*; in 1895-99, to 1*s.*; in 1900-04, to 2*s.* 3*d.*; in 1905-09, to 2*s.* 4*d.*; an increase of nine to ten fold over the period prior to 1890. The high *per capita* import since 1900 has, of course, been due in part to the necessities of the Russo-Japanese war; but the increase was well under weigh before that time and continued for some years after the war was over. Since about 1908 there has been some decline, partly accounted for by the annexation of Korea and the increase of supplies from that less densely populated territory (150 per square mile). On the whole it is pretty safe to conclude that, in spite of the recent decline, Japanese imports of food materials will continue to increase unless something should occur to check her industrial development.

In the light of what has occurred in Japan it is of especial interest to note the trend of things in China. In the latter country, almost if not quite as much as in the former, the withdrawal of labour

¹³ These figures are based on *net* imports of such food-stuffs as may be regarded as necessities in Japan: rice, wheat, beans, flour, eggs, fish, &c.

from the fields in order to develop other than agricultural resources or to introduce modern industries, must necessitate the provision of new sources of food supply. In time these supplies may conceivably come from the less densely populated portions of the empire itself; but in the present backward condition of internal communications first resort is likely to be had to foreign markets. And already there are indications that such a movement has begun. The imports of necessary foodstuffs, such as fish and other sea products, flour, rice, sugar, &c., which in 1901-05 amounted to 6,200,000*l.* per annum, rose to 10,000,000*l.* in 1906-10, a *per capita* increase from 3½*d.* to 5½*d.* If the predicted economic awakening of China is really at hand, we may expect to see these figures enormously increased in the near future.

The foreign purchases of clothing and clothing materials by the "Canal Countries," as a whole, have, as already indicated in the table presented above, shown but little increase in absolute amount (44,800,000*l.* and 51,900,000*l.* per annum for the two periods) and their relative importance has declined (from 28·4 per cent. of the total imports to 23·8 per cent.). The Philippine Islands and Australia are the only two countries in the list in which the percentage has not fallen, and in these two the increase has been very slight, from 26·7 per cent. to 28·9 per cent. in the former, and from 31·2 per cent. to 31·6 per cent. in the latter country. In the Philippines the increase is due mainly to larger purchases of cotton cloths, and in Australia to the growing use of ready-made clothing. In all the other countries, as well as in these two, the largest single item is cottons, and the decline in relative importance is unquestionably due to the development of "protected" domestic industries producing the cheaper grades of these goods. It seems likely that this sort of development will continue and that future foreign purchases of clothing materials will be increasingly of the finer rather than of the cheaper grades.

By far the most significant feature of the import trade of the "Canal Countries" is, however, the increasing demand for industrial and structural materials. In every country on the list the purchase of this class of commodities is increasing in absolute amount; and in all but Mexico, Central America, and China, the relative importance has also risen. The most notable increases are in Chile, where the percentage has risen from 31·1 to 40·6; the Philippine Islands, from 13·2 to 18·9; Japan, from 53·2 to 59·3; Australia, from 44·2 to 47·1; New Zealand, from 45·8 to 47·2; and Peru, from 35·0 to 36·7. Even in China, Mexico, and Central America, the relative decline has been very slight, 1 per cent. each in China and Mexico, and only 0·1 per cent. in Costa Rica. It is probably accounted for by the political disturbances in those countries.

The chief items belonging in this general class of imports are, naturally, iron and steel products ; structural iron and steel, wire, railway materials, machinery, implements, and tools. The total imports of this sort (including only the important items) amounted to 20,656,000*l.* per annum in the first period and 35,812,000*l.* in the second, an increase of nearly 75 per cent. Machinery, implements, and tools, alone, increased from 5,178,000*l.* to 10,443,000*l.*, or nearly 100 per cent. In Japan, a remarkable feature is the rapidly increasing purchases of raw cotton and wool and yarns. The annual average import of 7,570,000*l.* in 1900-04 rose to 11,680,000*l.* in 1905-09, or over 54 per cent. Other large items for the whole group of countries are coal (except for Australia and Japan), the imports of which have increased over 30 per cent. ; and wood (except for Japan), which show a growth of 53 per cent.

In addition to the above classes of commodities, which are necessary for the development of industrial activity, are many others the increasing demand for which is often an accompaniment of the rise of such activity. Among these may be mentioned chemicals, kerosene (crude and refined), paper, leather, explosives, cement, &c. In all of the countries which we are here considering, these articles are in increasing importance in the foreign purchases. Imports of chemicals, for example, have risen from 3,185,000*l.* to 4,597,000*l.*, or nearly 50 per cent. ; paper, from 3,328,000 to 4,539,000*l.*, or 36 per cent. ; and kerosene, from 6,028,000*l.* to 6,862,000*l.* or nearly 14 per cent.

Taken in connection with the export figures already considered, this analysis of the imports of the "Canal Countries" gives a very definite impression of a group of nations which are passing through certain well marked transitions. On the whole the sparsely populated ones are increasing their production of domestic foodstuffs and the cheaper grades of clothing materials, and depending less on foreign supplies. In doing this, and in developing other resources, they find themselves obliged to increase their purchases of structural and industrial materials, especially the numerous products of iron and steel. In China and Japan, the excessive density of population creates a situation in which development of resources and the introduction of elaborative industries result first of all in a substitution of foreign for domestic foodstuffs, and then in increased demand for foreign industrial and structural materials. The foodstuffs demanded by these two countries are almost wholly of vegetable origin.

Before any attempt is made to form an opinion as to the effect of the opening of the Panama Canal on this trade, it is necessary to ask who are the possible competitors and what indication there is

concerning their present position in the field. In order to answer these questions it is proposed to examine, as briefly as possible, the export trade from Europe and the United States (and incidentally also from Canada) to the "Canal Countries" during the fifteen years from 1897 to 1911.

The only countries which have played any considerable part in this trade are those mentioned in the following table:—

Exports to Mexico, Central America and Colombia, the West Coast of South America, China, Japan, British Australasia, and the Philippine Islands.*

[Annual average values in millions of £'s.]

From.	1897-1901.	1902-06.	1907-11.†
United Kingdom	47·2	55·2	71·6
United States.....	21·4	35·2	41·1
Germany.....	10·5	15·1	19·0
France.....	3·3	3·8	5·0
Belgium.....	2·2	4·1	4·0
Netherlands	0·2	0·3	0·2
Austria-Hungary	0·4	0·4	0·3
Italy	0·7	1·0	1·2
Spain	1·1	1·0	1·0
Russia	0·8	3·0	2·5
Canada	0·5	0·8	1·3
Total	88·3	119·9	147·2

* The figures of special trade are used in each case.

† For Germany, France, Belgium and Spain, the figures for 1911 are not available, and the average is taken for four years 1907-10 only.

It will be seen at a glance that only the United Kingdom, the United States, and Germany, are really important competitors for the trade as a whole. Together they supply 89 per cent. of the total. The other countries on the list are either of no importance whatever, or their export trade is significant only in connection with particular markets. These latter cases will be mentioned in their proper place.

The relative positions of the three chief competitors can best be illustrated by reference to the percentages of the total trade, which they hold. These are as follows:—

Percentages of the total export trade held by the chief competitors.

	1897-1901.	1902-06.	1907-1911.
United Kingdom	53·5	46·0	48·6
United States.....	24·2	29·4	27·9
Germany.....	11·9	12·6	12·9
Other countries	10·4	12·0	10·6

The period from 1902 to 1906 was a rather abnormal one in relation to this trade. The great drought in Australia reduced her purchasing power and was particularly felt in English trade, for England is the greatest exporter to that country. In the same period Japanese trade relations, especially with the United States and England, were disturbed by the Russo-Japanese war. The clearest impression of the trend of development can, therefore, probably be obtained by comparing the first with the third period. Between these two periods British export to the "Canal Countries" has declined relatively, from 53·5 per cent. of the total, to 48·6 per cent., and the loss has been taken up by the United States and Germany, especially the former, the increases being from 24·2 per cent. to 27·9 per cent., and from 11·9 per cent. to 12·9 per cent. respectively. The relative position of "Other Countries" has remained practically unchanged.

Comparisons based upon the figures of large aggregates of trade with groups of countries whose commercial situation differs greatly are, however, far from conclusive. In order to understand the real position of the competitors it is necessary to examine this trade in specific directions. Their exports to the separate groups of "Canal Countries" must be taken up.

I. *Mexico.*

The total exports to Mexico from the European and American countries above-mentioned, amounted to 19,200,000*l.* per annum, for the period 1907-11. The chief contributors are the United Kingdom, the United States, and Germany, though France also deserves consideration. The figures are given in the following table:—

Exports to Mexico.

[Annual average values in millions of £'s.]

From.	1897-1901.	1902-06.	1907-11.*
United Kingdom	1·8	2·0	2·4
United States	5·6	9·3	11·8
Germany.....	1·1	2·0	2·2
France.....	0·9	1·2	1·6
Belgium	0·3	0·4	0·3
Italy	0·0	0·2	0·2
Spain	0·3	0·5	0·5
Canada	0·0	0·0	0·2
Total	10·0	15·6	19·2

* See footnote †, p. 376.

The United States, United Kingdom, Germany, and France, are all increasing their exports, but the rates of increase are very different, so that all except the United States are losing ground relatively. The percentages of the total trade are :—

Percentages of export trade to Mexico, held by the chief competitors.

	1897-1901.	1902-06.	1907-11.*
United Kingdom	18·0	12·8	12·5
United States.....	56·0	59·6	61·5
Germany.....	11·0	12·8	11·5
France.....	9·0	7·7	8·3
Other countries.....	6·0	7·1	6·2

* See footnote †, p. 376.

The preponderance of the United States in this market is not to be wondered at in view of the peculiar physical characteristics of Mexico, which make the transfer of goods north and south across the international frontier easier than shipment to either coast. The United Kingdom is losing ground, having fallen from 18 per cent. in the first to 12·5 per cent. in the third period. Germany and France have just about held their own, the former rising and the latter falling very slightly.

II. *Central America and Colombia.*

In this market the trade is rather more evenly divided between the chief competitors. The United Kingdom and the United States together hold over 70 per cent. of the total, most of the remaining 30 per cent. being in the hands of Germany and France. The figures are :—

Exports to Central America and Colombia.

[Annual average values in millions of £'s.]

From	1897-1901.	1902-06.	1907-11.*
United Kingdom	1·6	1·7	2·1
United States.....	1·8	2·3	2·8
Germany.....	0·5	0·7	0·9
France.....	0·6	0·6	0·7
Belgium.....	0·0	0·1	0·1
Italy.....	0·2	0·2	0·2
Spain.....	0·1	0·1	0·1
Total	4·8	5·7	6·9

* See footnote †, p. 376.

Belgian, Italian and Spanish exports are negligible. The percentages from the other four are :—

Percentages of the export trade to Central America and Colombia held by the chief competitors.

	1897-1901.	1902-06.	1907-11.
United Kingdom	33·3	29·8	30·4
United States.....	37·5	40·3	40·6
Germany.....	10·4	12·3	13·1
France.....	12·5	10·5	10·2
Other countries	6·3	7·1	5·7

The United States is in the lead here as in Mexico, but the United Kingdom is a much closer second. The gap between the two is, however, increasing, the former having risen from 37·5 per cent. of the total to 40·6 per cent., while the latter has fallen from 33·3 per cent. to 30·4 per cent. Germany's 10·4 per cent. has grown to 13·1 per cent., while France has shown a corresponding decline from 12·5 per cent. to 10·2 per cent. What the United Kingdom and France, therefore, are losing, the United States is gaining.

III. *West Coast of South America.*

In this trade the United Kingdom steps well to the front. Germany and the United States follow, but their exports together are barely equal to England's. The figures are :—

Exports to the West Coast of South America.

[Annual average values in millions of £'s.]

From	1897-1901.	1902-06.	1907-11.*
United Kingdom	3·7	5·4	7·5
United States	1·2	2·2	3·6
Germany.....	2·2	3·3	4·5
France.....	0·8	1·0	1·5
Belgium	0·3	0·8	0·8
Italy	0·3	0·4	0·6
Total	8·5	13·1	18·5

* See footnote †, page 376.

The part played by France, Belgium and Italy in this trade is relatively small, but the exports of Belgium are increasing a little

in importance. The trend of development is shown in the following percentages :—

Percentages of export trade to the West Coast of South America held by the chief competitors.

	1897-1901.	1902-06.	1907-11.
United Kingdom	43·6	41·2	40·6
United States.....	14·1	16·8	19·4
Germany.....	25·9	25·2	24·4
Other countries	16·4	16·8	15·6

Again English trade shows a relative decline (from 43·6 per cent. of the total to 40·6 per cent.), while that of the United States, though less than half as much in volume, is increasing (from 14·1 per cent. to 19·4 per cent.). Germany, like England, is losing ground, though the decline is not very noticeable (from 25·9 per cent. to 24·4 per cent.).

IV. *China.*

A larger number of countries is competing for Chinese trade than in the cases already examined, but the bulk of it is controlled by very few. Their relative positions are shown by the following figures :—

Exports to China (including Hong-Kong).

[Annual average values in millions of £'s.]

	1897-1901.	1902-06.	1907-11.*
United Kingdom	8·4	12·8	13·4
United States	4·0	8·1	6·2
Germany.....	2·2	3·4	3·3
France.....	0·3	0·5	0·6
Belgium.....	0·7	1·5	1·3
Netherlands	0·1	0·2	0·2
Austria-Hungary	0·1	0·2	0·1
Russia.....	0·8	3·0	2·5
Canada	0·1	0·1	0·2
Total	16·7	29·8	27·8

* See footnote †, p. 376.

The only competitors whose trade is of sufficient importance to require fuller consideration here are the United Kingdom, the

United States, Germany, Belgium and Russia. Their relative positions are given in the following table :—

Percentages of export trade to China held by the chief competitors.

	1897-1901.	1902-06.	1907-11.
United Kingdom	50·3	43·0	48·2
United States	23·9	27·2	22·3
Germany.....	13·2	11·4	11·8
Belgium	4·2	5·0	4·7
Russia	4·8	10·0	9·0
Other countries	3·6	3·4	4·0

Comparisons here are particularly difficult because of the disturbing influence, during the second period, of the Russo-Japanese war. Large quantities of supplies and other materials destined for one or other of the belligerents, especially Japan, undoubtedly found their way first to China, there to await convenient opportunity for shipment to the real purchasers. This fact probably explains the apparent decline in Chinese imports in the third period compared with the second. The geographical position of the United States is such that the greatest stimulus to this sort of trade was probably felt there, and the high percentage of the trade held by that country during the middle period as compared with either the first or the third is probably a rough measure of the extent to which such traffic was carried on. As a result of this disturbance of normal development, a better notion of the real trend of things is likely to be obtained by comparing merely the first and the third periods. Such a comparison reveals some rather interesting facts. The three leading competitors, England, Germany, and the United States, have all lost ground. In 1897-1901, they, together, held 87·4 per cent. of the trade ; in 1907-11, only 82·3 per cent. Belgium and France have just a little more than held their own, their combined share having risen from 6 per cent. to 6·9 per cent. Austria-Hungary's very small share has grown even smaller, while Canada's has increased a little. The most striking feature is the growth of Russia's exports which have *more than trebled in absolute amount* and have *nearly doubled in percentage of the total* (4·8 per cent. and 9 per cent. for the two periods respectively). They now are not far behind Germany's.

V. *Japan.*

In Japan, even more than in China, the normal trend of things was disturbed by the Russian war. There was a strong suction, so to speak, for supplies and war materials. Prior to the actual outbreak of hostilities, this probably stimulated imports from many

quarters, but after the declaration of war the flow of goods from Europe was seriously hindered by neutrality obligations. England's share in the total trade during the period 1902-06 was, for example, reduced by nearly one-fifth. But, as already pointed out with reference to Chinese trade, the position of the United States was very different, and it is not surprising that her share in the total trade during this same period increased by nearly one quarter. The best results, therefore, in estimating the normal trend, can, here, as in the case of China, be made by comparing only the first and the third periods. The figures are :—

Exports to Japan.

[Annual average values in millions of £'s.]

From	1897-1901.	1902-06.	1907-11.*
United Kingdom	7·3	7·4	10·5
United States	4·0	6·4	6·7
Germany.....	2·3	3·1	4·5
France	0·4	0·2	0·3
Belgium	0·5	0·8	0·8
Netherlands	0·1	0·1	0·0
Austria-Hungary	0·3	0·2	0·2
Canada	0·0	0·1	0·1
Total	14·9	18·3	23·1

* See footnote †, p. 376.

Only the United Kingdom, the United States and Germany play any considerable part in the trade. Their percentages of the total are as follows :—

Percentages of export trade to Japan held by the chief competitors.

	1897-1901.	1902-06.	1907-11.
United Kingdom	49·0	40·4	45·4
United States.....	26·8	35·0	29·0
Germany.....	15·4	17·0	19·5
Other countries	8·8	7·6	6·1

The trade is evidently becoming more and more concentrated in the hands of the United Kingdom, the United States and Germany. In the first period they controlled 91·2 per cent. of it; in the third, 93·9 per cent. But their relative position, compared to one another, has altered. In the first period England held a considerably larger share than the other two together (49 per cent. to their 42·2 per cent.); in the third period her share had declined to 45·4 per cent., while theirs had risen to 48·5 per cent. The United States and

Germany are, therefore, both gaining, absorbing what is lost by England and the other smaller competitors. Of the two, Germany, although her share is still much smaller than that of the United States, is increasing the more rapidly; German exports having increased 27 per cent. between the two periods, while American have risen only 9 per cent.

VI. *British Australasia.*

In both Australia and New Zealand, two countries whose combined trade is far more important than that of any of the other groups of "Canal Countries," England possesses advantages which place her far in the lead among the various competitors, and British sales to these countries approximate 75 per cent. of the total. The figures are:—

Exports to British Australasia.

[Annual average values in millions of £'s.]

From	1897-1901.	1902-06.	1907-11.*
United Kingdom	23·8	24·6	34·6
United States	4·5	5·8	7·2
Germany.....	2·0	2·3	3·3
France.....	0·3	0·3	0·3
Belgium	0·4	0·5	0·7
Italy	0·2	0·2	0·2
Canada	0·4	0·6	0·8
Total	31·6	34·3	47·1

* See footnote †, p. 376.

It can hardly be said that England has any competitors at all in this market, yet there are one or two features of American and German development which are deserving of attention. The proportions which they hold in the trade are shown in the following percentages:—

Percentages of export trade to British Australasia held by the chief competitors.

	1897-1901.	1902-06.	1907-11.
United Kingdom	75·3	71·6	73·5
United States.....	14·2	16·9	15·3
Germany.....	6·3	6·7	7·0
Other countries	4·2	4·8	4·2

It is interesting to note that England's share of the total suffered a considerable decline between the first and the second period, dropping

from 75·3 per cent. to 71·6 per cent., while the United States, Germany, and "Other Countries" show an increase. This marks a tendency which was probably one of the causes of the adoption by both Australia and New Zealand of a system of preferential import duties on British goods. The recovery in the third period, when England's share in the total rose again to 73·5 per cent., may be regarded as a rough measure of the success of the new system. What England has thus regained seems to have been lost mostly by the United States (whose share declines from 16·9 per cent. in the second period to 15·3 per cent. in the third), and by "Other Countries" (which show a fall from 4·8 per cent. to 4·2 per cent.). Germany has continued to gain slowly, but her share, even in the last period, is only 7 per cent.

VII. *The Philippine Islands.*

Since the Spanish-American war the position of the United States with reference to the Philippine trade has been similar to that of England in relation to Australasian markets. Preferential import duties on American goods, combined with the more general introduction of American economic customs and American capital, seem to be rapidly giving American products a monopoly of the market. The figures are:—

Exports to the Philippine Islands.

[Annual average values in millions of £'s.]

	1897-1901.	1902-06.	1907-11.*
United Kingdom	0·6	1·3	1·1
United States.....	0·3	1·1	2·8
Germany.....	0·2	0·3	0·3
Spain	0·7	0·4	0·4
Total	1·8	3·1	4·6

* See footnote †, p. 376.

The percentages are:—

Percentages of export trade to the Philippine Islands, held by the chief competitors.

	1897-1901.	1902-06.	1907-11.
United Kingdom	33·3	42·0	23·9
United States.....	16·7	35·4	60·9
Germany.....	11·1	9·7	6·5
Spain	38·9	12·9	8·7

The figures require but little comment. The trade is small but, such as it is, it is passing into American hands. In 1897-1901 Spain held the largest share, but is now rapidly disappearing from the market. What Spain lost seems at first to have been divided between England and the United States, for both made marked advance in the second period, England in 1902-06 holding an even larger share than Spain had prior to that time. Since then, however, England has fallen far behind, and in the third period held only 23·9 per cent., against 60·9 per cent. for the United States. German trade is also declining rapidly in relative, though not in absolute amount.

The facts brought out by this long and tedious, but necessary, analysis, would seem to justify the following conclusions: 1. The "Canal Countries" are, as a whole, developing domestic supplies of the cheaper grades of clothing materials. 2. With the exception of China and Japan, they are becoming better able to supply their own foodstuffs. 3. They are all, through the more or less rapid transition from simpler to more elaborate industries, rapidly increasing their demand for industrial goods, especially manufactures of iron and steel. 4. The competition between the various sellers of such goods as they require is resulting, more and more, in a concentration of the trade in the hands of three countries: the United Kingdom, the United States and Germany.¹⁴

These three chief competitors each possess certain distinct advantages and disadvantages in the trade. England's position is particularly strong in that she is, in a certain sense (except in Mexico, Central America and Colombia), already in possession of the field. Germany and the United States are the attacking parties. England's long pre-eminence in the markets, the wide-spread knowledge of the excellence of English goods, the reputation of British traders for "square dealing," the position of London as the international clearing house, the supremacy of the British mercantile marine, the absence of import duties which has led to the building up of a vast "assembling" and transshipment trade; these and other things all operate strongly in her favour. On the other hand, this very strength has led to certain weaknesses; conservatism of method, both in manufacture and marketing, a lack of adaptability to peculiarities of demand, a certain over confidence in the inevitability of continued success.

Germany's chief advantage probably lies in the tremendous energy with which her attack has been made. Coming most recently into the field of commercial and industrial competition; with a well defined public determination to capture foreign markets and a

¹⁴ In China, Russia is also becoming an important competitor.

general willingness to take pains to learn from any source whatever ; ready to make goods in any form, shape, or size that any particular market might demand ; with a corps of commercial travellers so thoroughly trained in technical schools and business houses as to make them the best in the world ; it is not surprising that a considerable measure of success has been the result. Nevertheless, no one at all familiar with foreign markets can fail to recognize that this very energy and versatility has carried with it certain abuses which in recent years have injured German trade. The determination to undersell and to cater to vagaries of demand has led less responsible producers to put on the market sufficient quantities of excessively cheap goods and imitations seriously to injure the reputation of German products in many countries.

The United States has possessed, to a greater degree than either England or Germany, the enormous advantage of unlimited natural resources, especially of iron and fuel and water power, and of large scale manufacture of many of the sorts of commodities which the "Canal Countries" have been demanding. In regard to Mexico, Central America and Colombia, the proximity of those markets has also been a powerful factor making for commercial predominance. But, on the other hand, two or three things have operated most seriously against American expansion of foreign trade. First and foremost is probably the enormous value of the home markets for all sorts of manufactured goods, minimizing the incentive to enter very seriously into foreign competition. Scarcely, if at all less important has been the highly protective fiscal system which by raising the cost of manufacture and giving a certain monopoly of the home market has prevented American exporters from meeting English or German prices in the competitive markets except more or less spasmodically in times when "glut" of the home market has made "dumping" profitable.

Now, under the conditions existing during the past fifteen years, the competition between these three countries has had certain rather well defined results. On the whole, in the trade with the "Canal Countries," the German and American attack on the market has met with some success. England, although still holding nearly 50 per cent. of the trade, has declined, while the United States and Germany have both increased their share.

In every one of the seven groups of "Canal Countries" the United Kingdom holds a smaller share of the trade in the third, than in the first period, though in several of them (Central America and Colombia, China, Japan and Australasia), the third period shows a slight increase over the second. Comparing the third with the first period, Germany has strengthened her position in all the

groups except the West Coast of South America, China, and the Philippine Islands, though the increase is small. The United States has made relative gain in every country except China, though she has lost a little in Australasia if we compare the third period with the second. On the whole the greatest relative advance has been made by the United States.

This fact that the United States, in spite of serious handicaps, has more than held its own in the competition points to a really important advance once the Panama Canal is in full operation; for that country will unquestionably reap greater benefits in increased accessibility of the markets in question than England, Germany, or any other European country. It is quite unnecessary to examine in minute detail the exact amounts of saving which can be effected by the use of the canal on particular trade routes, in order to convince one's self of this fact. The broadest outlines of relative advantage will suffice.

In Mexico, Central America and Colombia, the United States already has advantages of distance and accessibility which merely will be accentuated by the opening of the Pacific as well as the Atlantic ports of those countries.

On the West Coast of South America (the distances to which by all-sea routes are at present practically the same from both European and American ports) New York will gain an advantage equal to the difference in distance between England and Colon and New York and Colon, or about 2,500 miles. With the toll rate at \$1.20 per net registered ton, some traffic between New York and Southern Chile will probably continue to use the Magellan route, but in the main this west coast trade will use the canal.

In the Philippine Islands, the United States possesses advantages quite apart from any question of trade routes, which unquestionably will keep the lion's share of such trade as may develop there in American hands.

In Australasia, China and Japan, the markets which not only are the most valuable to-day but which also possess the most promising possibilities of development, the canal will offer facilities to America far greater than to Europe. To European traders with these countries it is a matter of relative indifference, so far as distance is concerned, whether the new route is opened or not; for it will not greatly affect the accessibility to them of these markets. As already pointed out, vessels from English or German ports would actually lose time by choosing the Panama route except to New Zealand. Unless other advantages of the new route shall develop, there is little likelihood that the Suez or the Cape of Good Hope routes for Oriental and Australasian traffic with Europe will, in any very

large measure be abandoned. New York, on the other hand, will find the handicap of distance under which her exporters now labour, converted into a very considerable advantage in distance for all important ports except Hong Kong and Manila.

If, in addition to these advantages, the promise of the recent American elections in relation to tariff revision be carried out, and American exporters, especially of iron and steel products, be thus relieved of the incubus of high cost of production and exaggerated importance of the home market, it will be safe to predict a large expansion of American export trade with even the Oriental and Australasian countries within a few years after the opening of the new Canal.

DISCUSSION *on* PROFESSOR HUTCHINSON'S PAPER.

MR. ACWORTH, in proposing the vote of thanks, said the Paper had carried them over a pretty large field, but his impression was that on trade, as distinguished from trade routes and shipping interests, the effect was not going to be at all as large as one had been inclined to imagine. Professor Hutchinson began by saying that the Suez Canal made a greater change in geography than the Panama Canal could. It made a great change in shipping routes, but he did not suppose that it had made very much change in the course of trade. He spoke under correction, but he should think that the trade in the main was between the countries and generally in the commodities that it had been before. It seemed to him that would almost *a fortiori* be so in the case of the Panama Canal. He was not attempting to dogmatise; he was only saying that that was the impression left on his mind. There were many members who were more qualified to speak than he was with regard to that. One thing which had impressed him was that the figures surely showed the immense importance of non-economical and political causes. He might take the somewhat startling instance of the Philippines, which formerly had 38 per cent. of the Spanish trade but now had 12 per cent., and had a small percentage of American trade but now had 60 per cent., and, as the Professor had said frankly, the United States meant to keep it. Professor Hutchinson had also mentioned that, in his judgment, the very small preference given by Australia had turned the scale back again in favour of Great Britain. Taking the case of China, the trade of China would be very much more affected by the question whether China got a progressive and stable government like Japan, than by anything that a trade route could touch; so that one conclusion he came to was that political questions were of so much importance that economical development might well be entirely controlled by political rather than purely economic factors. Then, of course, capital investment had not been touched upon. Taking Mexico as compared with Argentina, which, after all, was very accessible to America, there was practically no investment of

American capital in Argentina, and America hardly competed. In Mexico there was a very large American investment, and England in consequence was in the background. Again, as it seemed to him, America might be much handicapped by the lack of "back loading." Taking Chili for example, either America or Europe might send coal to Chili but the "back loading" was practically nitrate, and the consumption of nitrate in America, he supposed, was very small compared to what it was in the old agricultural countries of Europe. Supposing political alterations or social alterations led to the cultivation in an intensive manner of the old farm lands of New England and the Atlantic states, then he could imagine that the imports of Chili from the United States would largely increase. In looking at the figures one wondered what the real causes were. He did not know how it struck other members of the Society, but it struck him very forcibly. He certainly had thought that Germany had increased their proportion of trade much more to the Canal countries than the figures showed. As they knew, German trade had enormously increased. If it had not gone to those countries, it must have gone very largely to the neighbouring European countries; and one might say the same thing as between the United States and Mexico. How much was it due to proximity, which he supposed meant knowledge by the merchants of the habits and customs of the neighbouring country and social intercourse and, therefore, somewhat similar habits of life, or how much was it due, as in the case of Australia and Great Britain, to the benefit of political arrangements? Clearly the answer as to the effect of the Panama Canal would very much depend on what causes were likely to be predominant.

Mr. SALE, in seconding the vote of thanks, said Professor Hutchinson's analysis of the general trend of development in the Orient and also in Australia would be of great assistance to all interested in estimating the changes likely to result from the opening of this new waterway between two great oceans. That fact induced him to offer a few comments and suggestions on somewhat minor points concerning more particularly the Orient. For instance, with regard to Tables V and VI he suggested that silk might be separated from the other animal products and placed in a separate column under the designation of sericultural products. The Tables would then give a better comparison of like with like in the chief groups of exports from the various countries. Such a distinction was also of importance in considering the freight available for Panama Canal traffic. A large export of animal products usually suggested a large quantity of bulky freight. As a matter of fact raw silk was an article of great value within small compass, and for that reason purchases for the United States could never be diverted to the Panama route from the much shorter journey *via* Vancouver or San Francisco. He thought there was a difference on page 373 in the figures relating to Japanese imports of food stuffs. Imports in the five years ending 1909 did not amount to more than about 2s. 6d. *per capita*, and he thought the figures for the earlier years should be corrected in like proportion. The fact remained,

however, as stated by Professor Hutchinson, that changing economical conditions were leading to vastly greater imports of food stuffs into Japan. The author's conclusion on page 387 that the United States was gaining trade with Japan at the expense of Great Britain was true so far as the percentage was concerned, but account should be taken of the natural products such as raw cotton, kerosene oil, phosphates, &c., with which Great Britain could not compete and which entered largely into the figures of the United States. If the comparison were confined to manufactured goods, he thought it would be found that the relative percentages would not vary very greatly in the two periods. In some directions, such as metals and machinery, the United States had improved their share very considerably, but taking all manufactures together he thought Great Britain had maintained her position. Of course, as he had said, all those were minor details and did not greatly affect the broad conclusions of the analysis on pages 372, 376 and 382, with which, on the whole, he was in agreement. Turning from the analysis to the final conclusions regarding trade with Australia, Japan, and China, it was said that "the canal would offer facilities to America far greater than to Europe," and that "New York would find the handicap of distance under which her exporters now labour converted into a very considerable advantage in distance for almost all important ports in the Orient and Australia." He was disposed to believe that so far as these countries were concerned, Professor Hutchinson was on safer ground in his opening remarks, when he said that mere saving of distance was but one factor among many, and the changes to be brought about by the opening of the canal might easily be exaggerated. Indeed, part of the value of the interesting paper to which they had listened lay in the emphasis given to those warning words. The saving of the time on the voyage from New York was a small matter in comparison with the disadvantages of the Panama route for vessels trading to and from the Orient and Australia—for instance, the absence of coaling stations and the large amount of space that must necessarily be reserved for bunkers for a voyage of from 6,500 to 8,000 miles compared with the much shorter distances between coaling stations on the Suez route. Even if coaling stations were established on the islands in mid-ocean there were no return cargoes available for colliers, therefore the cost of bunkers would always be much higher than at ports on the Suez Canal route, to which coal was carried at very low rates by vessels looking to return cargo for their profit. For these reasons it did not seem to him likely that the Panama Canal would have very much effect on the course of trade between New York and the Orient and Australia, or that the United States would gain much advantage in these particular trades through the opening of the Panama Canal.

Mr. MORETON FREWEN said that during the past fifteen years he had been much on the Pacific Coast and had heard the hopes expressed as to the result of the completion of the Canal. Professor Hutchinson had contributed a very valuable paper, but he (the speaker) did not share the view that the United States was

destined to be an exporter of manufactured metals to China. Given any measure of political stability in China, that country was likely to manufacture iron and steel for the whole world. Few people in England, or even in the East Coast States of America, were aware that China was to-day putting high-class pig-iron on shipboard at Hankow at a price with which no white labour anywhere could compete. At the present time the Dollar Line of Steamships, running from Hankow to San Francisco, Portland and Seattle, found its chief import in pig-iron from the Hang Yan works at Hankau. Considering the rate of wages in China, the high efficiency of Chinese labour and the juxtaposition in the great Yangtse Valley of vast beds of coal and iron, China's predominance in these trades could be only a matter of time. At present Hankow sold pig-iron, f.o.b., from the Hang Yan works at 16 taels per ton, say 2*l.* 10*s.* Very recently, Mr. Charles Schwabe stated in an interview that he was buying this pig-iron in large consignments. (Mr. Schwabe, now of the Bethlehem Works, was for some years President of the United States Steel Corporation.) Judge Gary, the present head of the United States Steel Corporation, sent Mr. Watson, their Chief Inspector, to report on the running of the great steel rolling mill at Hankau, and Mr. Watson reported that this mill, able to turn out 400 tons of steel rails per day, was operated at the highest state of efficiency; that the wages paid to skilled Chinese labour were one fifteenth the rate paid at Pittsburg, and the efficiency of the yellow man was 90 per cent. of that of the white man. It might be regarded as fortunate for them that this great steel plant was destroyed in the Revolution a year ago and the menace for the moment removed. Chinese labour at the iron mines, some fifty miles up the river above Hankau, was to-day putting high-class iron ore upon the railway cars at a contract price of 5*l.* per ton. The cost per ton, even with steam shovels, in the Mesaba Range in Minnesota would be at least four times greater. He thought, in view of developments, that it was certain with the opening of the Canal the export of iron and structural steel from China to the United States would be very great, and, seeing that the Japanese were unable to secure a footing anywhere where the rate of wages was high, Japan was destined to become a great nation of carriers. Japan would become the shippers of Chinese exports to the world's markets. Only in that way could Japanese labour secure a good rate of wages and thus accumulate what Japan needed so sorely, that is capital. He wished to say a few words on a somewhat esoteric subject neglected in Professor Hutchinson's valuable paper—the effect of the present very low rates of silver exchange in contracting America's exports to China and in expanding China's exports to America. In 1905-06-07 the rates of exchange were high, and thus China was able to buy gold exchange on Portland or Seattle and, with this, purchase American steel rails, lumber and flour. In 1908 exchange fell enormously, with the result that in 1908 and 1909 the exports of these articles to China almost dried up. The reason appears to be obvious and elementary. The Shanghai merchant who in 1907 was able to buy

a thousand feet of good dressed Oregon lumber in Portland for \$30 gold, paid 35 taels for these \$30 gold; but to buy \$30 gold at the rate to which silver exchange fell in 1908, the Shanghai buyer had to pay not 35 but some 48 taels; the result was he turned round and bought his lumber for 39 taels per thousand feet from the Manchurian mills. The question of the rate of exchange should in connection with the Panama Canal be studied very carefully. Unless silver recovered its exchange value, not merely would China be unable to buy from them or from the United States, but it was quite certain that China would become an active exporter of all sorts of goods which are to-day the product of white labour.

Mr. E. R. CALTHROP dealt with the opportunities for development on the Pacific coast of North and South America which the opening of the Canal would bring into play. He was especially grateful that the Paper should have been read in London, in view of the fact that there was reason to believe that the enormous opportunities for development on the Pacific coast of North and South America which the opening of the Canal would bring into play, were not so well appreciated in this country as they were either in the United States or in Germany. Professor Hutchinson's figures showed that, in the undeveloped countries most to be affected by the opening of the Canal, America and Germany had more recently advanced their trading position, while the position of the United Kingdom had retrograded. While the United States, Canada, and Germany were making most substantial preparations for the change in conditions to be produced by the Canal, so far as information was available, no preparations of any magnitude were being entered into in this country. The importance of the occasion demanded immediate attention if Great Britain was to improve or even maintain its position. At Vancouver, San Francisco, Seattle and other Pacific ports of Canada and the United States, the coming changes were fully appreciated, and enormous projects for the improvement of harbour and dock accommodation had already been elaborated, and in some cases were actually under construction; Germany was organising steamship services while Great Britain, with its enormous advantage in the possession of the West Indies, seemed to have made no preparations and hardly yet appeared to realise the fact that the Panama Canal was approaching successful accomplishment. Professor Hutchinson's exposition of the relative advances already made by America and Germany in the countries to be served by the Panama Canal, conveyed a moral which would not be overlooked by his audience; and in venturing to draw attention to the developments in view on one part only of the Pacific coast of Mexico, his (the speaker's) object was to invite consideration as to whether Great Britain should adequately participate in or surrender those business opportunities to Germany and the United States, as, for all the interest or action she appeared to be taking, she seemed inclined to do.

Mr. BICKERDIKE thought Mr. Acworth had raised an important question in asking what were the fundamental causes of the big

difference between the proportion of British goods sent to a country like Australia and the proportion sent to a country like Canada or Mexico, and questioned whether the opening of the Panama Canal would make any serious difference to the proportion of United States goods which went to a country like Australia on account of the lower freight. He thought that if they considered the causes of the great difference in the proportions of the exports of Great Britain to different countries, the conclusion was that the opening of the Panama Canal, by the mere lowering of sea freight relatively, say, from New York to Australia as compared with London to Australia, would make very little difference indeed. The reason why Australia took such a large proportion of British goods now was that people went backwards and forwards a great deal, and the result was that the sort of things which were wanted in Australia were the things made here; whereas in Mexico people went backwards and forwards much more easily to the United States, and so they did in Canada. What would make a far more greater difference than any change in the mere cost of freight of the goods would be anything that would alter the amount of time which people took in going backwards and forwards. If a railway were made in substitution for a steamship line, it would very likely make an enormous difference to the amount of trade done even if it carried only passengers. The figures given in the Paper went to illustrate that it was not sea freights or any other sort of freight that was really the determining factor so far as the great majority of goods were concerned. Of course, very bulky things were an exception. The Canal would only make an alteration in the sea freights of no very great amount, and the effect on the proportion of trade done by various countries would not be at all considerable.

The PRESIDENT said that it required much skill and knowledge to "survey mankind from China to Peru" as Professor Hutchinson had done. Such a survey, directed to a special inquiry, was much more interesting than ordinary commercial geography. An unusual feature in the Paper and discussion was the frequent use of the future tense. Of course, the future was particularly uncertain so far as it depended on political causes. Thus, if the United States should abandon their disabling Protectionist policy, a change in the channels of trade might result. But, as Sidgwick used to say, the popular description of prophecy as the most gratuitous form of error was wrong. What is gratuitous is troubling about the past. We must forecast the future if we are to act at all. He (the President) was not quite certain to what practical questions Professor Hutchinson's forecasts were directed. They supplied data for the solution of an interesting if not a practical problem; if the Government of United States were free to charge discriminating prices to the ships of different countries using the Canal, what system of charges should they adopt so as to maximise their own pecuniary benefit? He mentioned this problem the more readily as it afforded him an opportunity of referring to a Paper in which

the data for the solution of such a problem were admirably stated—the Paper on Panama Canal Tolls and the Theory of Monopoly, by Professor Hutchinson, in the current number of the *Economic Journal*.

Professor HUTCHINSON, in reply, said it had been suggested that the Panama Canal would not create trade. That it was not the force that was going to create it he agreed. He had intended to make that clear in the Paper. He was not considering the Panama Canal or the Suez Canal as the prime cause of the production of trade. He was attempting to get away from that and examine the trade that existed and had developed, whatever the causes might be. They might be political, they might be due to the investment of capital, they might be due to some sort of special economical relationship between the two countries, and it might be any one of a thousand and one different causes that had produced the development. All he had tried to do was to ask how the change in the trade route was going to modify whatever development had taken place from whatever cause. With regard to Australian trade, he had said at the beginning of the Paper there was a very great deal of uncertainty as to what the precise effects of the opening of the Canal were going to be. It was more or less a matter of speculation, whether the trade from New York, for example, to Australia was going to use the Panama Canal or to continue the Suez or the Cape of Good Hope routes. The freighters mostly used the Cape of Good Hope at present. But there were one or two points he thought the speaker who had brought up the question had overlooked. In the first place, the distance between the coaling stations on the route from New York to Australia were not so different comparing the present route and the new route *via* the Canal; because, except for mail steamers, the present route was not chiefly through the Suez Canal but by the Cape of Good Hope route, and there was a tremendous distance from Cape Town clear across to Australia which had to be covered. He was not sure of the exact distance between the possible coaling stations at Panama and Tahiti on the Panama route to New Zealand and Australia. In the second place, he thought the speaker had overlooked this fact. He stated this very tentatively, but it was the conclusion of the expert who had been engaged for many years by the Panama Canal Commission in Washington to study the effects on trade routes of the opening of the Canal. His statement was that the cost of coal on the Panama route was going to be so much less than the cost on the Suez route or the Cape of Good Hope route that it would go a long way towards causing vessels from New York to Australia to use the Panama Canal. There was still another point which was a matter of speculation also. He was told by shipping men who were familiar with the Pacific Ocean trade that it was not at all unlikely that the steamships in the Pacific, at any rate, in the near future would all be burning oil, and the necessary fuel bunker space in an oil-driven steamship was so much less than the coal bunker space that was required, that the distance between fuel stations did

not play such an important part for such steamers as it would for coal-driven vessels. Vessels using the Panama route could get oil fuel, while he was very doubtful whether vessels using the Cape route could get oil fuel at any reasonable price. He was perfectly willing to admit that it was a matter of speculation, but there was a great deal to be said on both sides. Another point had been made with regard to the effect of the slight reductions of freight rates which were likely to result from the reduction of distance. How great these reductions would be in actual freight rates it would be almost impossible to tell. They might possibly be not so slight as the speaker who had brought up the point indicated; but even if they were, he should not agree with him with regard to the unimportance of the effect upon the carriage of passengers and mails. It did make a very grave difference in the development of trade relations, and particularly in the development of new trade relations, whether mails could pass regularly, quickly and uniformly between the ports in question. He had travelled pretty extensively in all the countries which were touched upon, and he felt that he knew personally a great deal in relation to that particular point. One of the gravest difficulties that American exporters had met on the west coast of South America, for example, had been due to the irregularity and infrequency of the mails, and one of the greatest handicaps they had laboured under had been the fact that English and European mails were frequent and regular, while American mails were not. If the distance from New York to the west coast of South America were reduced, as it would be by opening the Canal, by 2,500 miles, it was going to make a great deal of difference in the mail carriage. Even if there were no difference whatever in the freight costs, that was going to be a very important factor in stimulating trade between these two places.

The following candidates were elected Fellows of the Society:—

Thomas Evans Argill.
Bal Krishna, M.A.
William Butler, M.B.
Percy Chadwick.
John Claston.

Charles Hart.
Thomas Herbert Hughes.
James William Nixon, B.Sc.
Henry Lyon Trachtenberg, B.A., A.I.A.

PRICES OF COMMODITIES IN 1912. By A. SAUERBECK.

THE following table shows the course of prices of forty-five commodities during the last twenty years as compared with the standard period of eleven years, 1867-77, which in the aggregate is equivalent to the average of the twenty-five years 1853-77 (see the *Journal*, 1886, pp. 592 and 648, and 1893, pp. 220 and 247):—

Summary of Index Numbers. Groups of Articles, 1867-77 = 100.

	Vegetable Food (Corn, &c.).	Animal Food (Meat, &c.).	Sugar, Coffee, and Tea.	Total Food.	Minerals.	Textiles.	Sundry Materials.	Total Materials.	Grand Total.	Silver.*	Wheat Harvest.†	Average Price of Consols.‡	Average Bank of England Rate.‡
1893	59	85	75	72	68	59	68	65	68	58·6	90	98½	3 1/10
'94	55	80	65	66	64	53	64	60	63	47·6	106	101	2 1/10
'95	54	78	62	64	62	52	65	60	62	49·1	91	106¼	2
'96	53	73	59	62	63	54	63	60	61	50·5	112	111	2 5/10
'97	60	79	52	65	66	51	62	59	62	45·3	97	112¼	2 1/10
1898	57	77	51	68	70	51	63	61	64	44·3	116	111	3 1/4
'99	60	79	53	65	92	58	65	70	68	45·1	109	107	3 3/4
1900	62	85	54	69	108	66	71	80	75	46·4	95	99½	4
'01	62	85	46	67	89	60	71	72	70	44·7	103	94	3 3/4
'02	63	87	41	67	82	61	71	71	69	39·6	110	94½	3 1/10
1903	62	84	44	66	82	66	69	72	69	40·7	101	90¾	3 3/4
'04	63	83	50	68	81	71	67	72	70	43·4	90	88¼	3 3/10
'05	63	87	52	69	87	72	68	75	72	45·7	110	89¾	3
'06	62	89	46	69	101	80	74	83	77	50·7	112	88¼	4 1/4
'07	69	88	48	72	107	77	78	86	80	49·6	113	84	4 9/10
1908	70	89	48	72	89	62	73	74	73	40·1	108	86	3
'09	71	89	50	73	86	64	76	75	74	38·9	113	83¾	3 1/10
'10	65	96	54	74	89	73	81	81	78	40·5	102	81	3 1/10
'11	70	90	61	75	93	76	81	83	80	40·4	110	79¼	3 5/10
'12	78	96	62	81	110	76	82	88	85	46·1	97	76½	3 5/10
Average													
1903-12 ..	67	89	52	72	93	72	75	79	76	43·5	106	84¾	3 6/10
1890-99 ..	61	80	63	68	71	56	66	61	66	55·8	103	103½	3
'78-87....	79	95	76	84	73	71	81	76	79	82·1	97	99½	3 2/10

* Silver 60·84d. per oz. = 100.

† Wheat harvest in the United Kingdom to 1895, 29 bushels = 100, from 1896, 30 bushels = 100.

‡ Consols and bank rate actual figures, not index numbers; Consols 2¾ per cent. from 1889, 2½ per cent. from April, 1903.

The index number of all commodities was 85 last year, or five points higher than in 1911. It was 15 per cent. *below* the standard period 1867-77, but 12 per cent. *above* the average of the last ten years, and 29 per cent. *above* the average of the lowest decade on record, 1890-99 (average index number 66).

Corn, meat and minerals were higher, while other articles showed little change on the average, the prices being higher for coffee, hides,

petroleum, wool, jute, hemp and wood, but lower for sugar, cotton and linseed oil.

The monthly fluctuations were as follows:—

February, 1895....	60·0	December, 1910....	77·9	June, 1912....	85·5
July, '96....	59·2	„ '11....	80·9	July, „	86·5
„ 1900....	76·2	January, 1912....	81·8	August, „	85·9
December, '01....	68·4	February, „	82·9	September, „	86·7
May, '07....	82·4	March, „	84·4	October, „	85·8
February, '09....	71·9	April, „	85·0	November, „	85·3
December, '09....	76·3	May, „	85·3	December, „ ...	86·4

Prices advanced in the first seven months, and had their highest point in September. There was a slight weakness in October and November, but an important rise at the end of the year.

Taking articles of food and materials separately, the index numbers compare thus (1867-77 = 100 in both cases):—

	Average.			Feb., 1895.	July, 1896.	July, 1900.	May, 1907.	Feb., 1909.	Dec., 1911.	Dec., 1912.
	1878-87.	1890-99.	1903-12.							
Food	84	68	72	63·8	60·0	71·2	73·5	70·8	78·9	78·4
Materials	76	64	79	57·0	58·6	79·8	88·9	72·6	82·3	92·2

Articles of food are nearly the same as a year ago, but materials are 12 per cent. higher. The level of materials is the best since 1876, and of minerals alone the highest since 1874.

The position of the six separate groups of commodities at the end of the last three years in comparison with whole periods is illustrated by the following index numbers (1867-77 = 100 in each case):—

	Average.			Dec., 1910.	Dec., 1911.	Dec., 1912.	Last Year, per Cent.
	1878-87.	1890-99.	1903-12.				
Vegetable food, } corn, &c.	79	61	67	63·9	75·5	72·6	fall 4
Animal food (meat } and butter)	95	80	89	91·0	90·0	96·9	rise 7½
Sugar, coffee, and tea	76	63	52	51·7	66·2	57·7	fall 13
Minerals	73	71	93	91·1	100·6	117·3	rise 16½
Textiles.....	71	56	72	76·1	68·6	82·5	„ 20
Sundry materials.....	81	66	75	82·4	80·7	83·2	„ 3

On the average all sorts of corn were higher, while the closing prices indicate a decline. Meat ruled considerably dearer for all descriptions, while sugar fell from 14s. 9d. per cwt. to 9s. 5d. in view of a large crop. Coffee fully maintained the high prices of a year ago. Amongst minerals there is a considerable advance everywhere. Iron rose from 50s. 2d. per ton to 67s. 6d., copper from 63l. per ton to 76½l., tin from 205l. to 229½l., lead from 16l. to 18¾l., coal in London from 20s. 6d. to 21s. 6d. per ton, while the

¹ In January, 1913, also 86·4, according to the *Statist.*

average export value of coal for the whole year advanced from $11\frac{7}{16}s.$ per ton to $12\frac{11}{16}s.$ Cotton had fallen in the previous year to $5d.$ per lb., touched $7\frac{1}{2}d.$ and closed at $7\frac{1}{8}d.$ in 1912. Fine wool rose about 10 per cent., coarse wool 15 per cent. Jute had an improvement of nearly 30 per cent., and hemp and flax were also higher. Hides, leather and petroleum had a strong advance, timber was also dearer, but linseed oil, which had been on a high level since the end of 1909, and rose from 39s. per ton to over 46s. in May, declined to 25s. in December.

Quarterly Movements of Prices.*

Summary of Index Numbers, 1867-77 = 100.

Years.	Quar- ters.	Vege- table Food (Corn, &c.).	Animal Food (Meat, &c.).	Sugar, Coffee, and Tea.	Total Food.	Mine- rals.	Tex- tiles.	Sundry Mate- rials.	Total Mate- rials.	Grand Total.	Silver †
1904.....	IV	63.4	83.4	55.3	69.1	81.7	68.4	67.6	72.5	71.0	45.2
	I	62.6	85.7	58.6	70.3	85.6	67.9	67.0	72.3	71.5	44.6
'05	II	63.1	88.4	53.0	70.3	83.9	69.7	68.5	73.0	71.9	43.8
	III	61.9	87.9	47.9	68.6	87.0	74.9	67.9	75.2	72.4	45.8
	IV	62.9	86.6	46.1	68.1	91.1	75.5	70.8	78.5	74.1	48.8
	I	62.1	89.6	45.3	68.7	96.7	76.5	72.1	80.1	75.3	49.7
'06	II	63.8	89.0	45.1	69.2	99.1	81.3	72.7	82.5	76.8	50.3
	III	61.3	89.3	16.5	68.5	101.4	80.1	73.3	83.0	76.9	50.7
	IV	61.7	87.9	47.0	68.1	110.5	80.4	76.6	86.9	78.9	53.0
	I	64.0	88.7	46.7	69.5	112.2	80.0	78.8	88.2	80.2	51.5
'07	II	69.7	88.7	48.0	72.1	112.6	79.8	80.0	88.7	81.7	50.6
	III	70.1	89.1	19.1	72.7	106.5	76.8	77.5	85.1	79.9	51.9
	IV	73.8	87.0	48.2	73.3	95.9	71.2	76.5	80.1	77.2	43.3
	I	71.7	88.9	49.1	73.3	92.0	64.9	73.8	76.0	74.9	42.0
'08	II	71.1	90.0	50.0	73.7	87.7	62.6	71.7	73.2	73.4	40.3
	III	68.2	90.3	47.2	71.9	88.4	61.7	71.7	73.1	72.6	39.3
	IV	67.8	85.1	47.0	69.8	88.5	61.0	74.3	74.0	72.2	37.7
	I	69.3	85.2	48.7	70.8	85.5	60.2	74.4	73.0	72.1	38.5
'09	II	76.1	91.1	49.6	76.0	84.9	62.8	75.5	74.1	74.9	39.9
	III	70.6	90.6	49.9	73.6	86.5	67.4	75.3	75.9	74.9	39.0
	IV	67.9	88.2	52.8	72.2	88.2	70.3	77.6	78.2	75.7	38.9
	I	68.6	95.0	51.6	75.4	90.8	71.4	79.5	80.0	78.1	39.1
'10	II	61.2	98.8	55.2	75.1	88.1	72.3	80.1	79.9	77.9	40.7
	III	64.6	98.1	53.5	74.6	87.5	72.4	81.7	80.4	78.0	40.5
	IV	63.7	90.6	50.0	70.7	90.1	76.0	82.9	82.7	77.6	41.8
	I	65.1	90.1	54.0	72.0	92.2	77.8	82.3	83.6	78.7	39.9
'11	II	70.1	89.2	55.1	74.0	92.2	82.3	81.3	84.5	80.1	40.3
	III	71.4	88.9	64.7	76.4	92.4	73.9	81.0	81.9	79.6	39.7
	IV	75.7	88.8	69.1	79.2	98.4	69.1	80.7	81.9	80.7	41.5
	I	77.8	93.7	67.1	81.4	103.4	72.4	80.7	84.2	83.0	44.1
'12	II	80.4	98.6	62.6	83.4	107.8	73.9	82.6	86.7	85.3	46.2
	III	77.6	99.2	59.8	81.9	115.0	77.2	82.7	89.7	86.4	47.2
	IV	74.2	93.4	57.8	77.8	116.9	81.0	83.3	91.7	85.8	47.9

* The four quarterly figures of each year do not in all cases exactly (in the decimals) agree with the annual averages, as the latter are partly calculated from revised figures. See also the *Journal*, 1893, p. 221; 1895, p. 144; 1901, p. 90; and 1909, p. 70.

† Silver 60.84d. per oz. = 100.

The quarterly numbers show the average of the three monthly figures, and by thus eliminating minor fluctuations they give a more trustworthy comparison of the gradual changes in the various groups of commodities. Corn was at its best in the second quarter of the year and meat rose in the first three quarters, while the third column reflects the great fall for sugar. Minerals rose all through the year, and so did textiles on the average—in fact, all materials had a gradual advance.

The following figures show in each case the average index numbers of all the forty-five commodities for ten years (see the dotted line in the diagram of the *Journal*, 1886, and also the *Journal*, 1893, p. 220); they give the best picture of the gradual movement of the average prices of whole periods, as the ordinary fluctuations are still further obliterated:—

1818-27 = 111	1888-1897 = 67	1897-1906 = 70
'28-37 = 93	'90- '99 = 66	'98- '07 = 71
'38-47 = 93	'92-1901 = 66	'99- '08 = 72
'48-57 = 89	'93- '02 = 66	1900- '09 = 73
'58-67 = 99	'94- '03 = 66	'01- '10 = 73
'68-77 = 100	'95- '04 = 67	'02- '11 = 74
'78-87 = 79	'96- '05 = 68	'03- '12 = 76

The decade 1890-99 was the lowest on record more closely calculated, and since then the average advanced from 66 to 76, or 15 per cent.

Silver rose steadily until early in October, principally under the influence of heavy Indian requirements, which, in addition, absorbed again an unusual amount of gold. A slight reaction set in in October and November, but an improvement later on, and in December the top price was $29\frac{1}{16}d.$ The second part of December was lower, and the metal closed at $29d.$ per oz. The prices and index numbers were as follows ($60\cdot84d.$ per oz. being the parity of 1 gold to $15\frac{1}{2}$ silver = 100):—

	Price.	Index Number.		Price.	Index Number.
	<i>d.</i>			<i>d.</i>	
Average 1890-99 ...	34	= 55·8	<i>Lowest</i> Nov., 1902	$21\frac{1}{16}$	= 35·6
" 1903-12	$26\frac{1}{2}$	= 43·5	End Dec., 1906 ...	$32\frac{5}{16}$	= 53·1
" 1893	$35\frac{5}{8}$	= 58·6	" Dec. '08	$23\frac{3}{16}$	= 38·1
" 1909	$23\frac{1}{16}$	= 38·9	" Dec. '10	$25\frac{1}{16}$	= 41·2
" '11	$24\frac{1}{8}$	= 40·4	" Dec. '11	$25\frac{1}{16}$	= 41·2
" '12	$28\frac{1}{8}$	= 46·1	" Dec. '12	29	= 47·7

Gold.—The production was estimated:—

	£
1881-85	21,000,000
'86-90	23,000,000
'91-95	33,000,000
'96-1900	53,000,000

	£
1901-05.....	66,000,000
'06	82,700,000
'07	84,800,000
'08	90,900,000
'09	93,300,000
'10	93,400,000
'11	96,000,000
'12	98,000,000

(rough estimates).

The *Rate of Discount* in the three principal markets is shown in the following table:—

[Per cent. and two decimals.]

	London.		Paris.		Berlin.		Average of the Three Markets.	
	Bank Rate.	Market Rate.	Bank Rate.	Market Rate.	Bank Rate.	Market Rate.	Bank Rate.	Market Rate.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
1895	2'00	0'80	2'10	1'59	3'14	2'02	2'41	1'47
1900	4'00	3'70	3'25	3'17	5'33	4'41	4'19	3'76
'07	4'90	4'49	3'47	3'40	6'03	5'12	4'80	4'34
'08	3'00	2'23	3'04	2'25	4'76	3'52	3'60	2'67
'09	3'10	2'26	3'00	1'79	3'93	2'87	3'34	2'31
'10	3'70	3'10	3'00	2'44	4'35	3'54	3'68	3'03
'11	3'50	2'89	3'14	2'67	4'40	3'59	3'68	3'05
'12	3'80	3'60	3'38	3'17	4'95	4'22	4'04	3'66

The average rates in 1895 were the lowest on record, those in 1907 the highest since 1873. The rates last year were moderate until September, but they rose at the outbreak of the Balkan war, and remained on a rather high level. The average market rate was about $\frac{5}{8}$ per cent. higher than in the previous year.

Review of the year.—Great prosperity prevailed throughout the year in most branches of trade notwithstanding a considerable number of adverse circumstances, such as the great coal strike in this country, the dock strike and other labour troubles, and the outbreak of the Balkan war combined with the fear of European entanglements. Shipbuilding had almost a record output, being only slightly exceeded in 1906, and the metal industries were extremely busy, while the cotton and wool trades were better than in the year before. The trade in the United Kingdom continued to surpass all previous records, and reached a total of 1,344,000,000*l.* (without bullion) against 1,237,000,000*l.* in 1911.

If European peace remains preserved everything points to a maintenance of the present prosperity for some time to come. The world's harvests have been satisfactory, industry is well employed, and in the United States there appears to be still room for further expansion. But notwithstanding these favourable symptoms, a comparison of the present prices, in the face of the enormous production in the world and the ever-increasing demand for gold, must make us think whether we have not reached a somewhat high level. The average prices of last year show the considerable

advance of 40 per cent. over the lowest year, 1896, while in addition the quantities may on the average have risen at the same or a very similar ratio. In the case of some important commodities, such as iron, coal, lead, spelter, cotton, sugar (not to speak of petroleum), the increase is much heavier, and sometimes over 100 per cent. It is only natural to assume that after a good harvest articles of food, which in many instances had scarcity prices, may show some reaction, but materials may also be at their best in the aggregate, and it appears doubtful whether the great rise will go on still further.

The arithmetical mean of the forty-five index numbers, which is 85 in 1912, 80 in 1911, 78 in 1910, 74 in 1909, and 80 in 1907, has been subjected to the usual test of using the same index numbers of the separate articles, but calculating each article according to its importance in the United Kingdom on the average of the years 1904-06. In this case the average is 83·7, against 77·7 in 1911 and 1910, 74·9 in 1909, and 77·4 in 1907. It will be seen that on the basis of quantities the ordinary index number, which has to be accepted for general purposes, slightly exaggerates the rise which has taken place, but it is also impossible to give the exact *proportion* of quantities, as they vary from country to country. In the United Kingdom some heavy goods, such as coal, iron and cotton, also corn, meat and wool, have a preponderating weight if quantities are accepted.

The price movements of the external trade of this country—total imports into the United Kingdom and exports of British and Irish produce—were as follows, 1873 called 111 in accordance with my index number (see the *Journal*, 1905, p. 146):—

	Total Imports into United Kingdom and Exports of British and Irish Produce.			Ratio of Values. 1873 = 111 (1867-77 = 100).	
	Declared Value.	Value at Prices of Preceding Year.*	Values at Prices in 1873.	British Trade.	My Arithmetical Index Numbers.
	Mln. £'s	Mln. £'s.	Mln. £'s.		
1873	626·0	—	626	111·0	111
'89	675·3	664·5	1,005	74·6	72
'96	681·7	671·5	1,162	65·1	61
1903	833·8	826·5	1,323	69·9	69
'04	852·2	847·0	1,345	70·3	70
'05	895·3	889·6	1,408	70·6	72
'06	983·7	940·9	1,480	73·8	77
'07	1,072·1	1,023·5	1,540	77·3	80
'08	970·4	1,010·1	1,451	74·2	73
'09	1,003·1	1,010·4	1,511	73·7	74
'10	1,109·0	1,057·7	1,593	77·3	78
'11	1,134·8	1,138·9	1,635	77·0	80
'12	1,232·3	1,209·2	1,743	78·5	85

* According to the valuable calculations of the *Economist*.

The third column at uniform prices shows the movements of quantities. Last year's total was about $6\frac{1}{2}$ per cent. larger than in the previous year. Since 1873 there is a total increase in the external trade of 178 per cent. and since 1896, the lowest year of prices, of 50 per cent. It must be admitted that the ratio of values (78·5) is considerably lower than the ordinary index number (85) and the weighted number (83·7), and the reasons must be sought in the following :

1. As frequently mentioned in these reports, the Board of Trade values follow the market values more slowly, which is also experienced in a falling market (1908 and 1896), and the declarations are inadequate.

2. There was a considerable rise last year for meat, iron and coal. Meat does not enter the Custom Returns at all (at least not the fresh home produce), and iron and coal only to a moderate extent in comparison with the total production.

3. Certain articles in the general trade—such as some manufactured goods—may have risen to a smaller extent, or may not show yet the full rise.

I find it necessary for various reasons to relinquish the collection of Prices and Index-Numbers, which I have given regularly in the Society's *Journal* since 1886, retracing the matter till 1818. Sir George Paish has, however, arranged to have the same continued in the *Statist* under his supervision as nearly as possible on the same lines as hitherto, and I am convinced that in his able and experienced hands most reliable data will be collected, and that the comparison with my figures will be fully maintained.

Construction of the Tables.

The Table of *Index Numbers* is based on the average prices of the eleven years 1867-77, and the index numbers have been calculated in the ordinary arithmetical way ; for instance, English wheat :—

	s.	d.	
Average, 1867-77....	54	6	= 100, average point.
„ '55	74	8	= 137, or 37 per cent. above the average point.
„ 1912	34	9	= 64, „ 36 „ below „

The index numbers therefore represent simple percentages of the average point.

Certain articles which appear to have something in common have been grouped together, with the following result :—

		1867-77. Total Numbers.	Example for 1912	
			Total Numbers.	Average.
1. Vegetable food, corn, &c. (wheat, flour, barley, oats, maize, potatoes, and rice).....	8 Index Nos.	800	624	78
2. Animal food (beef, mutton, pork, bacon, and butter)	7 "	700	672	96
3. Sugar, coffee, and tea	4 "	400	248	62
1—3. <i>Food</i>	19 "	1,900	1,544	81
4. Minerals (iron, copper, tin, lead, and coal).....	7 "	700	771	110
5. Textiles (cotton, flax, hemp, jute, wool, and silk)	8 "	800	610	76
6. Sundry materials (hides, leather, tallow, oils, soda, nitrate, indigo, and timber)	11 "	1,100	906	82
4—6. <i>Materials</i>	26 "	2,600	2,287	88
<i>General average</i>	45 "	4,500	3,831	85

The *general average* is drawn from all forty-five descriptions, which are treated as of equal value, and is the simple arithmetical mean as shown above.

Average Prices of Commodities.*

No. of Article } Year.	0	1 2 Wheat.		3 Flour.	4 Barley.	5 Oats.	6 Maize.	7 Potatoes.*	8 Rice.	1-8 Vegetable Food.	9 10 Beef.†	
	Silver.† d per oz.	English Gazette. s. and d. per qr.	American. s. and d. per qr.	Town Made White. s. per sack (280 lbs.).	English Gazette. s. and d. per qr.	English Gazette. s. and d. per qr.	American Mixed. s. per qr.	Good English. s. per ton	Rangoon Cargoes to Arrive. s. and d. per cwt.	Total	Prime. d. per 8 lbs.	Midling. d. per 8 lbs.
1898	26 $\frac{1}{2}$ $\frac{5}{10}$	34	37	33	27 $\frac{1}{2}$	18 $\frac{1}{2}$	17 $\frac{3}{4}$	82	7 $\frac{1}{2}$	—	46	36
'99	27 $\frac{7}{18}$	25 $\frac{1}{8}$	30	26 $\frac{1}{2}$	25 $\frac{1}{2}$	17	18	70	7 $\frac{1}{2}$	—	49	40
1900	28 $\frac{1}{4}$	26 $\frac{1}{11}$	31 $\frac{1}{6}$	27 $\frac{1}{2}$	24 $\frac{1}{11}$	17 $\frac{1}{2}$	20 $\frac{1}{4}$	78	7 $\frac{1}{4}$	—	51	42
'01	27 $\frac{3}{10}$	26 $\frac{1}{9}$	30	26 $\frac{1}{2}$	25 $\frac{1}{2}$	18 $\frac{1}{2}$	22 $\frac{1}{4}$	78	6 $\frac{1}{2}$	—	49	42
'02	24 $\frac{1}{10}$	28 $\frac{1}{10}$	30 $\frac{1}{6}$	26	25 $\frac{1}{8}$	20 $\frac{1}{2}$	25	69	6 $\frac{1}{2}$	—	54	47
1903	24 $\frac{3}{4}$	26 $\frac{1}{9}$	31	27	22 $\frac{1}{8}$	17 $\frac{1}{2}$	22	84	7 $\frac{1}{3}$	—	48	42
'04	26 $\frac{3}{8}$	28 $\frac{1}{4}$	33 $\frac{1}{6}$	28 $\frac{1}{2}$	22 $\frac{1}{4}$	16 $\frac{1}{4}$	21 $\frac{1}{2}$	90	6 $\frac{1}{2}$	—	48	42
'05	27 $\frac{1}{10}$	29 $\frac{1}{8}$	34	28 $\frac{1}{2}$	24 $\frac{1}{4}$	17 $\frac{1}{4}$	23	65	6 $\frac{1}{9}$	—	47	40
'06	30 $\frac{3}{8}$	28 $\frac{1}{3}$	32 $\frac{1}{6}$	26 $\frac{1}{2}$	24 $\frac{1}{2}$	18 $\frac{1}{4}$	22	67	7 $\frac{1}{3}$	—	47	40
'07	30 $\frac{3}{10}$	30 $\frac{1}{7}$	36	29	25 $\frac{1}{11}$	18 $\frac{1}{10}$	24 $\frac{1}{2}$	88	8 $\frac{1}{3}$	—	49	42
1908	24 $\frac{3}{8}$	32	37 $\frac{1}{6}$	31 $\frac{1}{2}$	25 $\frac{1}{10}$	17 $\frac{1}{10}$	26 $\frac{3}{4}$	81	7 $\frac{1}{7}$	—	52	45
'09	23 $\frac{1}{10}$	36 $\frac{1}{11}$	41 $\frac{1}{6}$	34 $\frac{1}{2}$	26 $\frac{1}{10}$	18 $\frac{1}{11}$	27 $\frac{1}{2}$	66	7 $\frac{1}{11}$	—	52	45
'10	24 $\frac{1}{8}$	31 $\frac{1}{8}$	36 $\frac{1}{6}$	31	23 $\frac{1}{11}$	17 $\frac{1}{4}$	23 $\frac{3}{4}$	72	7 $\frac{1}{3}$	—	54	48
'11	24 $\frac{1}{10}$	31 $\frac{1}{8}$	35	29	27 $\frac{1}{3}$	18 $\frac{1}{10}$	25 $\frac{1}{4}$	87	8 $\frac{1}{2}$	—	51	45
'12	26 $\frac{1}{10}$	34 $\frac{1}{9}$	38	32	30 $\frac{1}{8}$	21 $\frac{1}{6}$	27 $\frac{1}{2}$	86	10 $\frac{1}{11}$	—	56	49
Average												
1903-12 ...	26 $\frac{1}{2}$	31	35 $\frac{3}{4}$	29 $\frac{1}{2}$	25 $\frac{1}{4}$	18 $\frac{1}{4}$	24 $\frac{1}{4}$	78 $\frac{1}{2}$	7 $\frac{5}{8}$	—	50 $\frac{1}{4}$	44
1890-99 ...	34	28 $\frac{1}{2}$	31 $\frac{1}{2}$	27 $\frac{1}{2}$	25 $\frac{1}{2}$	17 $\frac{1}{2}$	19 $\frac{1}{2}$	72	6 $\frac{3}{4}$	—	47	37 $\frac{1}{2}$
'78-87 ...	50	40	43 $\frac{1}{2}$	34 $\frac{1}{2}$	31 $\frac{1}{2}$	21	25	102	8	—	55 $\frac{1}{2}$	46
'67-77 ...	58 $\frac{1}{2}$	54 $\frac{1}{2}$	56	46	39	26	32 $\frac{1}{2}$	117	10	—	59	50

Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.

1898	44 $\frac{1}{3}$	62	66	72	70	71	55	70	72	538	78	72
'99	45 $\frac{1}{11}$	47	54	58	66	65	55	60	72	477	83	80
1900	46 $\frac{1}{4}$	49	56	60	64	68	52	67	73	499	86	84
'01	44 $\frac{1}{7}$	49	54	58	65	71	68	67	66	498	83	84
'02	39 $\frac{1}{6}$	52	54	56	66	78	77	59	62	504	92	94
1903	40 $\frac{1}{7}$	49	55	59	59	66	67	72	72	499	81	84
'04	43 $\frac{1}{4}$	52	60	62	57	63	66	77	66	503	81	84
'05	45 $\frac{1}{7}$	55	61	62	62	67	71	56	67	501	80	80
'06	50 $\frac{1}{7}$	52	58	58	62	70	68	57	73	498	80	80
'07	49 $\frac{1}{6}$	56	64	63	64	72	75	75	82	551	83	84
1908	40 $\frac{1}{11}$	59	67	69	66	69	82	69	76	557	88	90
'09	38 $\frac{1}{9}$	68	74	75	69	73	85	56	71	571	88	90
'10	40 $\frac{1}{5}$	58	65	67	59	67	73	62	72	523	92	96
'11	40 $\frac{1}{4}$	58	63	63	70	72	78	74	82	560	87	90
'12	46 $\frac{1}{11}$	64	68	70	79	83	85	74	101	624	95	98

* The annual prices are the averages of twelve monthly or fifty-two weekly quotations; potatoes of eight monthly quotations, January to April and September to December.

† Index numbers of silver as compared with 60 $\frac{1}{4}$ d. per ounce being the parity between gold and silver at 1 : 15 $\frac{1}{2}$; not included in the general average.

‡ Meat (9-13), by the carcase, in the London meat market.

Average Prices of Commodities—Contd.

No. of Article }	11	12	13	14	15	9—15	16A	16B	17	18A*	18B*	19
	Mutton.		Pork.	Bacon.	Butter.	Animal Food. Total.	Sugar.			Coffee.		
	Prime.	Mid- dling.	Large and Small. Average.	Water- ford.	Fries- land, Fine to Finest.		British West Indian Refining	Beet, German, SS p. c., l.o.b.	Java, Floating Cargoes.	Ceylon Planta- tion, Low Mid- dling.†	Rio, Good.	Mean 18A and 18B
Year.	d. per 8 lbs.	d. per 8 lbs.	d. per 8 lbs.	s. per cwt.	s. per cwt.		s. per cwt.	s. per cwt.	s. per cwt.	s. per cwt.	s. per cwt.	
1898	52	37	45	58	95	—	9½	9½	11½	92	32	—
'99	54	41	40	51	103	—	10½	10	12¼	90	31	—
1900	59	45	44	60	102	—	11¼	10½	12½	75	40	—
'01	54	44	49	63	105	—	9¼	8½	10¾	70	35	—
'02	55	44	48	63	102	—	7¼	6¾	8½	70	31	—
1903	58	47	44	60	100	—	8½	8¼	9¾	70	30	—
'04	59	50	39	57	102	—	10¼	10¼	11½	75	37	—
'05	59	51	46	65	107	—	11	11¼	12½	75	40	—
'06	60	53	49	65	110	—	8½	8½	10	75	39	—
'07	60	54	45	63	108	—	9	9½	10½	75	31	—
1908	58	52	43	62	114	—	9¾	10½	11½	66†	31	—
'09	52	46	49	71	112	—	10¼	11	12¼	70	35	—
'10	58	52	54	75	114	—	11	12¾	13¼	69	42	—
'11	55	49	46	66	121	—	11½	13	14	83	58	—
'12	59	54	50	69	123	—	11	12¼	13¾	87	66	—
Average												
1903-12	58	51	46½	65½	111	—	10	10¾	12	74	41	—
1890-99	54½	41½	42½	59	100	—	11½	11½	13¾	98	62	—
'78-87	61½	53	49	71	116	—	17	18	21½	78	52	—
'67-77	63	55	52	74	125	—	23	24	28½	87	64	—
Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.												
1898	84	67	87	78	76	542	40	41	106	50	78	
'99	86	75	77	69	82	552	44	43	103	48	75	
1900	94	82	85	81	82	594	46	45	86	63	74	
'01	86	80	94	85	84	596	38	38	80	55	67	
'02	87	80	92	85	82	612	30	30	80	48	64	
1903	92	85	85	81	80	588	36	31	80	47	63	
'04	94	91	75	77	82	584	44	40	86	58	72	
'05	94	93	88	88	86	609	47	45	86	62	74	
'06	95	96	94	88	88	621	36	35	86	61	73	
'07	95	98	87	85	86	618	39	38	86	48	67	
1908	92	95	83	84	91	623	43	40	76	48	62	
'09	83	84	94	96	90	625	45	43	80	55	67	
'10	92	95	104	101	91	671	51	47	79	66	72	
'11	87	89	88	89	97	627	52	49	95	91	93	
'12	94	98	96	93	98	672	49	47	100	103	102	

* Index numbers not included in the general average.

† East India good middling from 1908.

Average Prices of Commodities—Contd.

No. of Article }	19A*	19C*	19B*	19	16-19	1-19	20A	20B	21	22	—	23
	Tea.				Sugar, Coffee, and Tea. Total.	Food. Total.	Iron.		Copper.		Tin.	
Year.	Con- gou, Com- mon. d. per lb.	Indian Good Medium. d. per lb.	Average Import Price. d. and dec. per lb.	Mean of 19A and 19B.			Scotch Pig. s. and d. per ton	Cleveland (Middle- brough) Pig. s. and d. per ton	Bars, Com- mon. £ per ton	Chili Bars. £ per ton	English Tough Cake. £ per ton	Straits. £ per ton
1898	4½	6½	9'13	—	—	—	47'2	42'2	5½	52	55	72
'99	5½	7¼	8'82	—	—	—	63'9	60'1	74	74	78	123
1900	5¼	6¾	8'58	—	—	—	69'4	69'3	9	73	77	134
'01	4	5¾	7'67	—	—	—	53'9	45'5	6½	66	71	118
'02	3¾	5¾	7'20	—	—	—	54'6	49'3	6½	53	57	121
1903	4¼	6½	7'71	—	—	—	52'3	46'3	6¼	58	62	127
'04	5	6¾	7'24	—	—	—	51'5	43'3	6½	59	63	127
'05	4¼	5¾	7'24	—	—	—	53'6	49'6	6½	70	74	143
'06	4	5¾	7'40	—	—	—	58'9	53'0	7¼	88	92	181
'07	5¼	7	8'13	—	—	—	63'6	55'7	7½	87	92	172
1908	5¼	6¾	7'96	—	—	—	56'1	50'5	6¾	60	64	133
'09	5	7¼	8'16	—	—	—	55'1	49'3	6½	59	62	135
'10	4½	7¼	8'23	—	—	—	56'1	50'1	6½	57	61	155
'11	5¼	8½	9'00	—	—	—	53'5	47'3	6¾	56	60	191
'12	5¾	8¼	8'78	—	—	—	64'2	58'2	7¾	73	78	210
Average												
1903-12....	4¾	7	8	—	—	—	56½	50½	6¾	66½	71	157
1890-99....	480	7½	9¾	—	—	—	47	41½	5½	50	53	81
'78-87....	6¾	—	12¾	—	—	—	46	38	5½	55	60	89
'67-77....	11¼	—	17¼	—	—	—	69	60	8¼	75	81	105

Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.

1898	40	—	53	46	205	1,285	68	—	67	69	—	69
'99	49	—	51	50	212	1,241	92	—	88	99	—	117
1900	47	—	50	49	214	1,307	100	—	109	97	—	128
'01	36	—	44	40	183	1,277	78	—	79	88	—	112
'02	33	—	42	38	162	1,278	79	—	74	71	—	115
1903	38	—	44	41	174	1,261	76	—	76	77	—	121
'04	44	—	42	43	199	1,286	74	—	74	79	—	121
'05	38	—	42	40	206	1,316	80	—	79	93	—	136
'06	36	—	43	40	184	1,303	86		88	117	—	172
'07	47	—	47	47	191	1,360	92		91	116	—	164
1908	47	—	46	46	191	1,371	82	—	82	80	—	127
'09	44	—	47	46	201	1,397	81	—	79	79	—	129
'10	40	—	48	44	214	1,408	82	—	79	76	—	148
'11	47	—	52	50	244	1,431	78	—	77	75	—	182
'12	48	—	51	50	248	1,544	95	—	89	97	—	200

* Index numbers not included in the general average.

Average Prices of Commodities—Contd.

No. of Article } Year.	24	25A	25B	26	20-26	27	28	29A	29B	30A	30B	31
	Lead.	Coal.			Minerals. Total.	Cotton.		Flax.		Hemp.		Jute.
	English Pig.	WallSEND Hetton in London.	Newcastle Steam.	Average Export Price.		Middling American.	Fair Dhollerah.	St. Petersburg.	Russian, Average Import.	Manila Fair Roping.	St. Petersburg Clean.	
	£ per ton	s. per ton	s. per ton	s. and dec. per ton		d. per lb.	d. per lb.	£ per ton	£ per ton	£ per ton	£ per ton	£ per ton
1898	13 $\frac{1}{4}$	16 $\frac{3}{4}$	10 $\frac{3}{4}$	9'92	—	3 $\frac{5}{10}$	2 $\frac{1}{2}$	24	25 $\frac{1}{2}$	27	25	11
'99	15 $\frac{3}{8}$	18 $\frac{1}{2}$	12	10'72	—	3 $\frac{1}{10}$	2 $\frac{3}{4}$	23	24 $\frac{1}{2}$	41	27	12 $\frac{1}{2}$
1900	17 $\frac{1}{4}$	23 $\frac{1}{2}$	17 $\frac{1}{2}$	16'75	—	5 $\frac{5}{10}$	4 $\frac{7}{10}$	35	30	39	28	14 $\frac{1}{4}$
'01	12 $\frac{3}{4}$	20	12 $\frac{1}{2}$	13'86	—	4 $\frac{1}{4}$	3 $\frac{5}{10}$	38	39 $\frac{1}{2}$	37	27	12 $\frac{3}{4}$
'02	11 $\frac{3}{8}$	18 $\frac{1}{2}$	11 $\frac{1}{4}$	12'29	—	4 $\frac{5}{10}$	3 $\frac{1}{10}$	32	37	43	27	12 $\frac{1}{4}$
1903	11 $\frac{3}{4}$	16 $\frac{1}{2}$	10 $\frac{1}{2}$	11'70	—	6'03	4 $\frac{1}{8}$	32	36	36	27	13 $\frac{1}{2}$
'04	12 $\frac{1}{4}$	16 $\frac{1}{4}$	9 $\frac{1}{2}$	11'13	—	6'60	5	36	38 $\frac{1}{2}$	38	28	14
'05	14 $\frac{1}{4}$	15 $\frac{1}{2}$	9 $\frac{1}{4}$	10'56	—	5'09	4 $\frac{5}{10}$	32	35	39 $\frac{1}{2}$	29	18 $\frac{1}{2}$
'06	17 $\frac{1}{2}$	16 $\frac{1}{2}$	10 $\frac{1}{2}$	10'90	—	5'95	4 $\frac{3}{10}$	33	37	41 $\frac{1}{2}$	31	23 $\frac{1}{2}$
'07	19 $\frac{1}{2}$	19 $\frac{3}{4}$	14 $\frac{1}{2}$	12'75	—	6'55	4 $\frac{7}{10}$	30	34	35	31	21
1908	13 $\frac{2}{8}$	18	12	12'77	—	5'72	4 $\frac{5}{10}$	23	29 $\frac{1}{2}$	24 $\frac{1}{2}$	28	15 $\frac{1}{2}$
'09	13 $\frac{1}{2}$	17 $\frac{1}{2}$	11	11'30	—	6'33	4 $\frac{3}{4}$	28	32 $\frac{1}{2}$	24 $\frac{1}{2}$	28	13
'10	13 $\frac{1}{4}$	17 $\frac{1}{4}$	10 $\frac{1}{2}$	11'72	—	8'00	6	35	37	23	30	14 $\frac{3}{4}$
'11	14 $\frac{3}{8}$	17 $\frac{3}{4}$	10 $\frac{1}{2}$	11'43	—	7'04	6	37	43 $\frac{1}{2}$	20	33	20 $\frac{1}{4}$
'12	18 $\frac{1}{4}$	21 $\frac{3}{4}$	14 $\frac{3}{4}$	12'70	—	6'45	5 $\frac{5}{10}$	36 $\frac{1}{2}$	40 $\frac{1}{2}$	26	37	21
Average												
1903-12....	14 $\frac{7}{8}$	17 $\frac{3}{8}$	11 $\frac{3}{8}$	11 $\frac{3}{8}$	—	6 $\frac{3}{8}$	4 $\frac{7}{8}$	32	36 $\frac{1}{2}$	31	30	17 $\frac{3}{4}$
1890-99....	12	17 $\frac{1}{2}$	10 $\frac{3}{8}$	10 $\frac{3}{8}$	—	4 $\frac{1}{4}$	3	27	27 $\frac{1}{2}$	26 $\frac{1}{2}$	25	12 $\frac{1}{2}$
'78-87....	14	16 $\frac{3}{8}$	8 $\frac{3}{8}$	9	—	6	4 $\frac{1}{4}$	33	34	35 $\frac{1}{2}$	26 $\frac{1}{2}$	15
'67-77....	20 $\frac{1}{2}$	22	12 $\frac{1}{2}$	12 $\frac{1}{2}$	—	9	6 $\frac{3}{4}$	46	48	43	35	19

Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.

1898	65	76	—	79	493	37	37	52	67	58		
'99	75	84	—	86	641	40	41	51	87	66		
1900	84	107	—	134	759	61	62	69	86	75		
'01	62	91	—	111	621	53	51	82	82	67		
'02	55	84	—	98	576	54	55	74	90	64		
1903	57	75	—	94	576	67	61	72	81	71		
'04	60	74	—	89	571	73	74	79	85	74		
'05	70	70	—	84	612	57	62	71	88	97		
'06	85	75	—	87	710	66	71	74	93	124		
'07	95	90	—	102	750	73	66	68	85	111		
1908	68	82	—	102	623	64	64	56	67	82		
'09	66	80	—	90	604	70	72	64	67	68		
'10	65	78	—	94	622	89	89	77	68	78		
'11	70	81	—	91	654	78	89	86	68	107		
'12	89	99	—	102	771	72	79	82	81	111		

Average Prices of Commodities—Contd.

No. of Article	32A	32B	33	34	27—34	35A	35B	35C	36A	36B	37A	37B
	Wool.			Silk.		Hides.			Leather.		Tallow.	
Year.	Merino, Port Phillip Average Fleece d. ⁸ per lb.	Merino, Adelaide, Average Grease. d. per lb.	English, Lincoln Half Hogs. d. per lb.	Tsatlee. s. per lb.	Textiles. Total.	River Plate, Dry. d. per lb.	River Plate, Salted. d. per lb.	Average Import. d. and dec. per lb.	Dressing Hides. d. per lb.	Average Import. d. per lb.	St. Petersburg, Y.C. s. per cwt.	Town. s. per cwt.
1898	13 ¹ / ₄	6 ⁵ / ₈	8 ³ / ₄	10 ¹ / ₂	—	7 ³ / ₈	6 ¹ / ₈	5·04	13 ¹ / ₂	13 ³ / ₄	40	22
'99	17 ¹ / ₄	8 ¹ / ₂	8 ¹ / ₄	13	—	7 ³ / ₈	6 ¹ / ₄	4·94	13 ¹ / ₂	13 ¹ / ₂	—	25
1900	15 ³ / ₄	7 ⁵ / ₈	7 ⁵ / ₈	13	—	8 ¹ / ₈	6 ¹ / ₄	5·31	14	13 ³ / ₄	—	27 ¹ / ₂
'01	13	6 ³ / ₈	6 ⁷ / ₈	10 ¹ / ₂	—	7 ¹ / ₂	6	5·34	14	13 ¹ / ₂	—	28
'02	15	7 ⁹ / ₈	6 ¹ / ₄	11	—	7 ⁵ / ₈	6 ³ / ₈	5·52	14	14 ¹ / ₂	—	32 ¹ / ₂
1903	16	8 ¹ / ₄	7 ¹ / ₄	13 ¹ / ₂	—	8	6 ¹ / ₂	5·75	14	15 ¹ / ₂	—	29 ¹ / ₂
'04	16	8	10 ¹ / ₈	12 ¹ / ₂	—	8 ¹ / ₄	6 ³ / ₄	5·66	14	15	—	26 ¹ / ₂
'05	17 ¹ / ₄	8 ³ / ₄	12 ³ / ₈	12 ³ / ₄	—	9	7 ¹ / ₄	5·98	14	15 ¹ / ₄	—	26 ¹ / ₂
'06	18	9 ¹ / ₄	13 ¹ / ₈	13 ¹ / ₂	—	10	7 ¹ / ₄	6·52	16 ¹ / ₂	16	—	30 ¹ / ₂
'07	18	9 ³ / ₈	12 ¹ / ₄	15 ¹ / ₄	—	9 ³ / ₄	7 ⁵ / ₈	6·98	16	17 ¹ / ₈	—	34 ¹ / ₂
1908	15 ³ / ₄	7 ⁷ / ₈	8 ¹ / ₂	10 ¹ / ₂	—	8 ¹ / ₄	5 ⁷ / ₈	6·30	14 ¹ / ₂	17 ¹ / ₄	—	30 ¹ / ₂
'09	17 ³ / ₄	9 ¹ / ₄	9	9 ³ / ₄	—	9 ¹ / ₄	7	6·73	15	17 ¹ / ₄	—	30 ¹ / ₂
'10	18 ¹ / ₄	9 ⁵ / ₈	9 ⁷ / ₈	10 ¹ / ₄	—	9 ³ / ₄	7 ⁵ / ₈	7·15	16	17 ¹ / ₂	—	35 ¹ / ₂
'11	17 ¹ / ₄	8 ¹ / ₂	10	10 ¹ / ₄	—	9 ³ / ₄	7 ¹ / ₂	7·17	17	17 ¹ / ₄	—	33 ¹ / ₂
'12	17 ¹ / ₂	9 ¹ / ₄	10 ¹ / ₂	10 ⁵ / ₈	—	10 ¹ / ₂	8 ³ / ₈	7·51	17 ¹ / ₂	17 ¹ / ₂	—	33
Average 1903-12....	17 ¹ / ₄	8 ⁷ / ₈	10 ³ / ₈	12	—	9 ¹ / ₄	7 ¹ / ₈	6 ⁵ / ₈	15 ¹ / ₂	16 ³ / ₄	—	31
1890-99....	13 ¹ / ₂	6 ¹ / ₂	11	11 ¹ / ₂	—	6 ¹ / ₄	5 ¹ / ₂	5	13 ¹ / ₄	13 ³ / ₄	43	25
'78-87....	18 ¹ / ₂	8 ³ / ₈	11 ³ / ₈	15	—	8 ³ / ₈	6 ¹ / ₂	6 ¹ / ₂	15	17	41	35 ¹ / ₂
'67-77....	21 ¹ / ₄	9 ⁷ / ₈	19 ³ / ₄	23	—	9	7	6 ⁷ / ₈	16	18 ³ / ₄	45	45

Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.

1898	64	44	46	405	82	—	84	—	69
'99	83	42	57	467	85	—	84	—	56
1900	76	40	57	526	90	—	87	—	61
'01	62	35	46	478	84	—	87	—	62
'02	72	32	48	489	87	—	87	—	72
1903	78	37	59	526	91	—	87	—	65
'04	77	51	54	567	94	—	87	—	59
'05	84	63	55	577	95	—	84	—	59
'06	87	68	60	643	103	—	94	—	68
'07	88	62	66	619	105		97		77
1908	76	43	46	498	90		91		68
'09	87	46	42	516	100		93		68
'10	90	51	45	587	106		96		79
'11	83	51	47	609	106		99		74
'12	86	53	46	610	114		101		73

* Port Phillip fleece washed nominal since 1895, exactly in proportion with the value of clean wool.

Average Prices of Commodities—Contd.

No. of Article } Year.	38	39	40A	40B	41	42	43	44	45A	45B	35—45	20—45	1—45
	Oil.		Seeds		Petro- leum.*	Soda.	Nitrate of Soda.	Indigo.	Timber.		Sundry Mate- rials.	Mate- rials.	Grand Total.
	Palm.	Olive.	Lin- seed.	Lin- seed.	Refined.	Crystals.		Bengal, Good Con- suming.	Hewn, Average Import.	Sawn or Split, Average Import.			
	£ per ton.	£ per ton.	£ per ton.	s. per qr.	d. per gall.	s. per ton	s. per cwt.	s. per lb.	s. per load.	s. per load.	Total.	Total.	
1898	23	32	16 $\frac{3}{4}$	36	5 $\frac{1}{8}$	54	7 $\frac{3}{4}$	3 $\frac{1}{2}$	42	47	—	—	—
'99	25	33	20	40	6 $\frac{1}{4}$	56	7 $\frac{3}{4}$	3 $\frac{1}{2}$	40	49	—	—	—
1900	27 $\frac{1}{2}$	36	30 $\frac{1}{2}$	54	6 $\frac{3}{4}$	62	8	3 $\frac{1}{2}$	41	56	—	—	—
'01	26	38	30	53	6 $\frac{1}{2}$	65	9	3 $\frac{3}{8}$	39	52	—	—	—
'02	27 $\frac{1}{2}$	34	28	50	6 $\frac{1}{4}$	64	9 $\frac{3}{4}$	3 $\frac{1}{4}$	39	51	—	—	—
1903	28	33	21	39	6 $\frac{1}{4}$	64	9 $\frac{3}{4}$	3 $\frac{1}{4}$	39	54	—	—	—
'04	27 $\frac{1}{2}$	32	16	33	6 $\frac{3}{8}$	64	10 $\frac{1}{4}$	2 $\frac{7}{8}$	36	51	—	—	—
'05	27	36	18	39	5 $\frac{5}{8}$	64	11	2 $\frac{7}{8}$	38	51	—	—	—
'06	30 $\frac{1}{2}$	39	20 $\frac{3}{4}$	43	6 $\frac{1}{2}$	64	11 $\frac{1}{4}$	3	40	55	—	—	—
'07	33	43	23 $\frac{1}{2}$	44	6 $\frac{3}{4}$	64	11 $\frac{1}{4}$	3 $\frac{1}{4}$	40	57	—	—	—
1908	27 $\frac{1}{2}$	43	22 $\frac{1}{4}$	45	6 $\frac{3}{4}$	61	10 $\frac{1}{2}$	3 $\frac{3}{4}$	36	53	—	—	—
'09	29	50	24 $\frac{3}{4}$	49	6 $\frac{3}{8}$	61	10 $\frac{1}{4}$	3 $\frac{1}{4}$	34	54	—	—	—
'10	35	47	38 $\frac{1}{2}$	66	6	61	9 $\frac{3}{4}$	3 $\frac{1}{8}$	36	57	—	—	—
'11	34 $\frac{1}{2}$	50	42 $\frac{1}{4}$	70	5 $\frac{3}{8}$	57	10	3	38	57	—	—	—
'12	33	48	35 $\frac{1}{4}$	60	8 $\frac{1}{4}$	53	11 $\frac{1}{4}$	2 $\frac{3}{4}$	41	60	—	—	—
Average													
1903-12....	30 $\frac{1}{2}$	42	26 $\frac{1}{4}$	48	6 $\frac{3}{8}$	61 $\frac{1}{2}$	10 $\frac{1}{2}$	3 $\frac{1}{2}$	38	55	—	—	—
1890-99 ..	24 $\frac{1}{2}$	35	19 $\frac{1}{4}$	38	5 $\frac{1}{4}$	53	8 $\frac{1}{4}$	4 $\frac{3}{8}$	40	45	—	—	—
'78-87 ..	32 $\frac{1}{2}$	40	23	46	6 $\frac{7}{8}$	62	12 $\frac{1}{2}$	6	47	47	—	—	—
'67-77....	39	50	30	60	12 $\frac{1}{2}$ *	92	14	7 $\frac{1}{4}$	60	54	—	—	—

Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.

				*									
1898	59	64	59	41	59	55	48	78	698	1,596	2,881		
'99	64	66	67	50	61	55	48	78	714	1,822	3,063		
1900	71	72	94	54	67	57	48	85	786	2,071	3,378		
'01	67	76	92	52	71	64	47	80	782	1,881	3,158		
'02	71	68	87	50	70	70	45	79	786	1,851	3,129		
1903	72	66	67	50	70	70	45	82	765	1,867	3,128		
'04	71	64	54	49	70	73	40	76	737	1,875	3,161		
'05	69	72	63	45	70	79	40	78	754	1,943	3,259		
'06	78	78	71	49	70	80	41	83	815	2,168	3,471		
'07	85	86	75	54	70	80	45	85	859	2,228	3,588		
1908	71	86	75	54	66	75	46	78	800	1,921	3,292		
'09	74	100	82	51	66	73	45	77	829	1,949	3,346		
'10	90	94	116	48	66	70	43	82	890	2,099	3,507		
'11	88	100	125	43	62	71	41	83	892	2,155	3,586		
'12	85	96	106	66	58	80	38	89	906	2,287	3,831		

* Petroleum as compared with the average from 1873-77 only.

THE HEALTH AND MEDICAL TREATMENT OF THE UNINSURED.

By STEWART JOHNSON.

So much thought has been concentrated on the health and medical treatment of persons insured under the Act, that the medical treatment and health of such persons as remain uninsured has dropped somewhat out of sight. Nevertheless, the provision of medical attendance and sick pay for the working classes, and the more regularly employed of the poor, will allow the question of the health and medical treatment of the poorest classes, who are frequently confounded with those rather better off, to be envisaged as a separate and distinct problem.

Before considering the main question, it may be well to arrive at some estimate of the numbers of the uninsured. They can be divided into several classes. First, there are those who are in receipt of more than 16*s*. a year, and are not manually employed. These may be mentioned merely to show that they have not been unintentionally omitted. They have their special problems, but this paper is not concerned with them. Next come the dependents of insured persons. These will form a considerable body. They will be eligible for sanatorium benefit on the recommendation of the insurance committees, and their position will be materially improved by reason of the sick pay and medical attendance which the head of the family will receive during those periods of illness in which, in earlier times, he would have been out of work and running up a doctor's bill. Moreover, we may anticipate that the dependents of insured persons will be by degrees drawn within the scope of the Insurance Act, as approved societies gradually accumulate sufficient surplus to enable them to grant medical benefits to dependents, a point which will be attained *on an average* in some twenty years' time, when the reserve value on lives entering insurance over the age of 16 has been redeemed. In addition, children of school age already receive medical attention from the education authorities, and will probably receive more in the future. The same remark applies to babies and the public health authorities. A third class of uninsured persons will also be eliminated as time goes on—voluntary contributors over the age of 45 who do not care to pay the enhanced premiums which their years entail. In twenty years' time the youngest of these will have passed out of the range of the Act.

There remain those compulsorily insurable who from the irregularity of their employment fail to obtain sufficient stamps on their cards to secure any benefits; those eligible for the voluntary section, who will refrain, on account of the smallness of their earnings, from contributing; and those ineligible on account of the nature of their work for either form of insurance. These three classes will amount, according to the actuarial calculations to close upon 2 millions (1,979,000) of which $1\frac{2}{3}$ millions (1,639,000) are men and $\frac{1}{3}$ million (340,000) women.

To these may be added the deposit contributors who are not insured in the full sense of the word, and whose position is to be reconsidered in January 1915. Of these there are computed to be rather over $\frac{3}{4}$ million (638,000 men and 244,000 women). Uninsured and deposit contributors together we have just over $2\frac{1}{2}$ million persons of both sexes (2,561,000). With their dependents they would probably constitute a class of at least 5 million persons, as nearly as possible $\frac{1}{3}$ th of the population of the United Kingdom, about the same proportion which Mr. Charles Booth and Mr. B. S. Rowntree in their investigations in London and York respectively have found to be in extreme poverty in those places.

How are these people provided with medical attendance?

The following is an attempt to answer this question, at least, so far as Greater London is concerned.

In the year 1908 I classified approximately one half (13,377) of the out-patients attending the Hospital for Sick Children, Great Ormond Street, by the scale drawn up by Mr. Rowntree,¹ and in the twelvemonth, April 1, 1909 to March 31, 1910, approximately one-third (9,851). The results of these investigations, which were published in the *Journal*, May, 1911, showed that in the first instance 47 per cent., and in the second, 45 per cent. of the families attending were in what Rowntree calls "primary poverty."

In one sense the Children's Hospital, Great Ormond Street, is a fair sample of the London hospitals, and in another not. First it is almost in the centre of London, and draws its patients from all quarters of London and the outer ring. Secondly, the members of its honorary staff are attached to some dozen or more general and special hospitals in various parts of London, and are all agreed that the patients treated at Great Ormond Street are certainly not poorer than those they see elsewhere. On the other hand, the hospital has the disadvantage for sampling purposes of being a children's hospital. The families on which the statistics are based are all families with children, and children are a cause of primary poverty. Earnings that will support a single man or woman in comparative comfort are frequently insufficient to maintain a family. Had similar figures been collected and tabulated at a London general hospital, where a proportion of the patients are bachelors and spinsters, it would possibly have been found that a

¹ The same cost of living has been taken for this purpose as that used by Rowntree, in York, in 1899. As a matter of fact the cost in London and in 1909 is each 1s. more. No attempt has been made to allow for these differences of cost, and they provide a margin of 2s. in every case, to compensate for any possible error on account of under statement of income by the parents of patients.

(The standard of diet used by Rowntree for his calculations was that of Atwater, which requires 125 grammes of proteid a day for a man doing moderate muscular work. Had the standard of Chittenden been adopted instead, which requires only 63 grammes of proteid daily, the cost of living for a family of five, father, mother and three children, would have been reduced by about 5s. a week. On the other hand, it clearly appears from the budgets kept by working class families that 5s a week is none too much margin to allow for the difference between the ideal and the performance.)

smaller percentage of the patients were below the line of primary poverty, probably if the conditions at York are a guide, 12 per cent. less, about 33 per cent. of the total out-patients. These figures receive some confirmation from the inquiries of Miss Roberts on behalf of the Poor Law Commission, who reported that some 38 per cent. of the out-patients of St. Thomas', St. Mary's and the Royal Free Hospitals belonged to the same class that received medical treatment at the Poor Law dispensaries. We take it then that between two-fifths and two-sixths of the patients who attend the voluntary hospitals in London will belong to the uninsured and deposit contributor class.²

But this class do not rely exclusively on the voluntary hospital for their medical attendance. They also furnish patients to the Poor Law doctors, and to private practitioners. Miss Roberts, in the report already mentioned, found that 11 per cent. of the out-patients attending these general hospitals had also paid visits to Poor Law dispensaries with half a year of treatment.

In the twelvemonth March to March, 1911-12, 5·5 per cent. of medical and of surgical casualties, and 2 per cent. of the out-patients at St. Thomas' Hospital, were referred to the Guardians of the Poor; at St. Mary's Hospital, in 1911, 2·5 per cent., and at the Royal Free 1·6 per cent. were dealt with similarly. At the London Hospital in the same year 7·58 per cent. were referred to the Poor Law for assistance, sanatorium, convalescent or medical treatment. At the Children's Hospital, Great Ormond Street, out of 2,977 out-patients interviewed by the almoner, 2·5 per cent. were referred to the Poor Law. These figures all fall short of the 11 per cent. of Miss Roberts, but a patient might quite legitimately attend a Poor Law doctor first and a voluntary hospital afterwards for some complaint which required special treatment without being referred back to the Poor Law authorities.

These percentages have reference, of course, to out-patients of all degrees of poverty, and not to those only that are below Rowntree's line. If we assume the latter to be one-third of the total out-patients, then all the percentages would be multiplied by three, and the 11 per cent. of Miss Roberts would become 33 per cent.

As regards the proportion that attend private practitioners, it was found at Great Ormond Street that in 1909 26 per cent., and in 1909-10 25 per cent. of the patients below Rowntree's line of primary poverty had visited doctors immediately before coming to the hospital. (Amongst these were not included those who had been sent with a card or a note by a doctor, nor those who had paid only one visit in an emergency. The average fee paid was 1s., and the average number of visits that had been paid was four, most often at intervals of two days.) The conclusion, then, that we may form, is that the

² It may be somewhat rash to prophesy on a subject which experience will soon determine; but although it is uncertain whether all those below Rowntree's line will fail to become members of assured societies, it is quite certain that if they do become members they will only be able to pay their weekly contributions by curtailing the diet of themselves and their families.

persons that in future will be the uninsured have, in times past, depended to a large extent on the voluntary hospitals, but that one-third of them have also been dependent on the Poor Law Service and one-fourth, to some extent, have availed themselves of private medical attendance.

But persons such as those under consideration need something more than medical attendance.

In the better off classes, medical advice having remedied the illness, the patient may be trusted to remain in his normal state of health. Where the "very poor," such as the uninsured will be, are concerned the normal mode of life is itself a further cause of illness.

The financial situation of the uninsured will render it an impossibility to them to carry out the instructions of the medical man, since one must consider as implied in the instructions of every medical attendant the provision of adequate food, warmth and shelter. It is little exaggeration to say that so far as these unfortunate people are concerned all recent progress in medical science has been in vain. On the other hand it must not be forgotten that there are other forms of charity besides medical. In fact many hospitals, the Children's Hospital, Great Ormond Street, amongst them, have almoners, whose express business it is to secure help for the patients, help other than medical, by co-operation with appropriate charities, in order that the medicine and medical advice given at the hospital may not be wasted. The assistance given in this way is without question most valuable. But its value is limited. It is of great use in helping a patient and his family through some crisis of sickness and misfortune, but for families whose existence is one continual crisis, the additional assistance is as likely to be lost as the medical. Such after-care as was given would in this instance have to be prolonged for the rest of the patient's life. The following figures will give some idea of the magnitude of the help required.

Out of the 9,851 families classified in 1909-10 at the Children's Hospital, Great Ormond Street, 4,445 or 45 per cent. were in primary poverty. To provide these families with the minimum necessities of life, to raise them above Rowntree's line of primary poverty, would require an addition of 1,077*l.* a week to their present wages. 9,851 was less than a third of the out-patients treated during the period, so that the figure 1,077*l.* ought to be multiplied by three at least to show the deficit in the incomes of the families of all patients, making 3,231*l.* The entire Out-Patient's Department cost in 1909 3,474*l.* Hence we arrive at the result: that it would cost almost as much weekly, as is spent yearly, on the medical treatment of the out-patients of Great Ormond Street, to place them in a position to profit thoroughly by the attention they receive. (Or if we multiply 3,231*l.* by 52 we find that the yearly deficit in earnings amounts to no less than 168,012*l.*, or sufficient money to maintain the entire Hospital, In-Patient and Out-Patient Departments together, including both ordinary, extraordinary and capital expenditure for five and a half years.)

Great Ormond Street Hospital is not an exception, or at least, it is only an exception in that its treatment is rather more costly than and its patients not quite so poor as at the majority of the London hospitals. It is obvious that it would be impossible even if it were desirable, for an almoner to obtain this amount of pecuniary help or its equivalent. Even if the amount 3,474*l.* were halved or quartered, the task would be as impossible, and the attempt almost equally undesirable.

At this stage it might perhaps be asked whether families in such a condition of want are not fitter objects for the assistance of the Poor Law than of a voluntary charity? Nevertheless, the answer cannot be yes. Although the majority of the class probably at some time or other during their career receive help from the Poor Law, yet their condition at the time of coming to the hospital was not so desperate, save in a few instances, that they could have expected to have obtained relief on application to the Guardians. Although in nearly two-thirds of the cases (64 per cent.) the head of the family was either irregularly or not fully employed, yet only 8 per cent. were actually out of work, and, except where such was the case, few Boards could be expected to help. Moreover, out-relief given on a scale to make good the deficiency in earnings would surpass even the subsidies to wages granted by the Guardians previous to 1832. The class, though in want, are not, to use Mr. Booth's contrasted terms, in distress. Although pauper matrix, the strata in which paupers are secreted, they are not themselves yet paupers. The Poor Law for the time being can do no more for them than voluntary charity. The more money that is expended on the class, short of a sum sufficient to raise the greater part of the class to a higher social plane, is so much more money thrown away.

The conclusion that is forced upon us is that whereas medical attendance upon the insured class may do much to prevent such poverty as has been caused in the past by sickness, little can be accomplished by medical treatment to prevent sickness among the uninsured until they are first raised out of poverty. The remedy for ill-health among the very poor is not medical but social and economic.

THE RATE OF INTEREST ON INVESTMENTS IN 1912.

By R. A. LEHFELDT.

THE following statistics are in continuation of those given in the December, 1912, issue of the *Journal*:—

TABLE A.—*Amount of investments in the form of issues exceeding 900,000l. each.*
[In 1,000 £.]

Date.	Fixed interest.			Shares.			Total.		Grand total.	Remarks.
	Home.	Colonial.	Foreign.	Home.	Colonial.	Foreign.	Fixed interest.	Shares.		
1912	6,446	23,003	53,636	4,729	21,375	10,919	83,085	36,123	119,208	{ Canadian Pacific share issue.
[Number of issues.]	6	16	26	3	1	7	48	11	59	

The most noticeable feature of the above table is that large share issues have increased in amount. The item "colonial shares" consists of the one gigantic issue of the Canadian Pacific Railway, which was not all made in London, but the amount issued in London is not stated separately. The home and foreign share issues also show increases from the average of recent years.

The grand total is about equal to that of 1910 and is only exceeded substantially by 1908. The total of home issues is larger than in any year since 1908.

TABLE B.—*Return on large investments at fixed interest (redemption value included).*

Date.	Home.	Interest promised.			Colonial —home.	Foreign —home.
		Colonial.	Foreign.	Mean (weighted).		
1912 ...	5·01	4·30	5·25	4·97	— 0·71	+ 0·24

Table B shows marked development of tendencies already noticed, the general average rate of interest, which was 4·49 in 1910, and 4·60 in 1911 rose to 4·97—the highest on record. The home issues, which now are all industrial, yield nearly as high interest as foreign ones. The colonies, which continue to borrow largely through their governments, now command the best rate of interest, but even they have to pay noticeably more than they did a few years ago.

The average yield on Consols during the year was 3·35. Hence the yield on new investments exceeded that on Consols by 1·62 per

cent., which is more than it has been lately. This means that the price of Consols instead of being low, is, relatively to other stocks, *more unreasonably high than ever.*

Issues in 1901.

In the former paper, in dealing with shares, the actual dividends for the ten years following issue were taken as indicating the result of the investment. It is now possible to make a calculation on this basis for the stocks of 1901. In that year there were 19 large issues at fixed interest and 4 of shares. Of the former group, one, the bonds of the Ecuadorian Association, have been in default, and a composition has been effected. In consequence of this the average return for the ten years is about 4·5 per cent. instead of 6·67 per cent. promised. The influence of this on the average return on all the capital invested that year is trifling.

The share issues and the dividends paid on them were as follows :—

	Average yield.	Price of issue.	Price, December, 1911.
G.E.R.	3·05	100	67
N.E.R.	5·76	100	125
Lanc. and York. R.	3·95	100	94
Buenos Ayres G.S.R.	5·25	107½	125
Weighted mean	4·65	103	107

As the average yield on the “fixed interest” issues for that year was 3·01 per cent. investors in shares have been more fortunate by about 1·64 per cent. Their property has, moreover, appreciated from 103 to 107, while the bonds issued in 1901 have depreciated 10 to 15 per cent. This result is characteristic of a period of rising prices.

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*Changes in bodily form of descendants of immigrants*. By Franz Boas, Ph.D. Reprinted from the reports of the United States Immigration Commission. xii + 573 pp., 8vo. New York : Columbia University Press; and London : Henry Frowde, 1912. Price 7s. 6d. net.

The Preliminary Report of the Commission for which the data forming the basis of this volume were collected, was briefly reviewed in a Current Note in the *Journal* for January, 1911 (pp. 231—35). As then pointed out, the results and conclusions at which Dr. Boas has arrived are distinctly remarkable, and are here illustrated by additional data and further discussed. The greater part of the volume (pp. 167 to end) consists, it should be said, of an appendix, giving the tables of anthropometric data.

As may be remembered, the result of the investigation is this : that the children born to immigrants after their arrival in the States differ (in most cases) significantly from the children born abroad before the immigration of the parents, and these differences, in the opinion of Dr. Boas, are the result of the direct action of the environment and cannot be ascribed to selection—nor perhaps it should be added to illegitimacy. Such differences exist in stature, weight, head length, head width, head index and width of face, but hardly as regards hair colour. In the present volume data are given for Bohemians, Hungarians and Slovaks, Neapolitans, Sicilians and East European Jews, the two latter (for whom data were given in the Preliminary Report) affording a remarkable contrast. The American-born Hebrew children show an increase in stature, in weight and in head length, but a decrease in head width and a consequent decrease in cephalic index. American-born children of Sicilian parents show on the whole a slight decrease of stature and of weight (though the changes are small), a decrease in head length, little change but on the whole a slight increase in head width, and consequently an increase in cephalic index. If the children are classified into two groups according as they were born within ten years of the arrival of the mother or later, the latter seem to show a slightly increased change. For the foreign-born Sicilian children the mean head index is 79·5, for the children born in the States within ten years of the arrival of the mother 80·9, for those born

later 81.8. For the corresponding groups of children of Hebrew parents the averages are 84.6, 82.4, 82.3. The figures thus give some suggestion of a convergence towards a common mean.

The theory that the differences observed might be due to a change in the type of immigrant is eliminated by comparing the differences between parents and their foreign-born and American-born children respectively. This procedure leads to precisely similar results. The theory that they might be due to illegitimacy is confuted by the fact that, when the data are treated by the method last described, the comparison of mothers and children leads to much the same results as the comparison of fathers and children; further, using a somewhat indirect procedure to get over the difficulty of age, the correlation between fathers and American-born sons is practically the same as that between fathers and foreign-born sons.

"Earnest advocates of the theory of selection," Dr. Boas admits (p. 75), "might claim that all these changes are due to the effects of changes in death-rate among foreign-born and American-born," but it seems to him that the burden of proof lies with those who claim that the required correlation between death-rate and head index, width of face, &c., exists. "I grant the desirability," he adds, "of settling the question by actual observations, but until these are available we may point out that the very suddenness of the changes after immigration, and the absence of changes due to selection by mortality among the adult foreign-born, would require such a complicated adjustment of cause and effect in regard to the correlation of mortality and bodily form that the theory would become improbable on account of its complexity." The apparent suddenness of the change on immigration of the parent is a difficulty also for the usual form of the environmental theory; the influence exerted by the environment seems to act not directly on the child, but *via* the parents of the child, as appears also to be the case if the increased change for longer residence of the mother may be accepted as real. If the influence were exerted directly on the child, those born before the immigration of the parents should show some effect, and the change should be gradual, as it is in fact in the case of width of face (Fig. 40, p. 73), not sudden as it apparently is in the case of head index (Fig. 35, p. 62). But the data are, perhaps, hardly sufficient to enable one to speak with confidence of these changes as "sudden" or as "gradual." The greatest difficulty for the selection theory, it seems to the present writer, lies in the almost impossibly high selective death-rates that would be implied. It is to be hoped that the Commission will continue the collection of data, as the points raised are of the very highest scientific importance.

The nature of the data—the fact that they refer for the most part to children—creates, it may be noted, some difficulty in their treatment. Dr. Boas has to resort in some cases to a not very satisfactory reduction of the measures to their equivalent for adults, and the correlation between parent and offspring is estimated by an indirect method. It does not seem to us, however, that any doubts as to such processes affect the essential conclusions.

G.U.Y.

2.—*Statistik der Heilbehandlung bei den Versicherungsanstalten und zugelassenen Kasseneinrichtungen der Invalidenversicherung für die Jahre 1906-11.* 193 pp. + maps. Berlin: Behrend and Co., 1912.

This volume, which is issued by the *Reichsversicherungsamt*, contains a statistical analysis of data accumulated by German public insurance authorities. In particular the results of the sanatorium on treatment of tuberculosis are tabulated in detail. We are not only provided with statistics of the gross numbers of cases admitted and the proportions still able to work at the end of one, three or five years, but, in addition, the cases are classified on the Turbau-Gerhardt system and the transferences from class to class recorded. An important feature is a classification by age and occupation of some cases. It is unfortunate that the material for this was incomplete, the total number of insured persons in each occupation group being unknown, while the special age distribution of each occupation is not given. The general age distribution for 1911 (the only year for which these particulars are available) shows that 14 per cent. of the women are between 16 and 20 years of age, as contrasted with 7 per cent. of males. There is also an excess of women at the next age group, an approximate equality from 25-30 and thereafter a relative excess of males.

It will be seen that this volume contains much of interest to the statistical student of morbidity. M.G.

3.—*Arzt und R. V. O. Der Arzt und die deutsche Reicherversicherungsordnung.* von Dr. Th. Rumpf. 114 pp. Bonn: Marcus and Weber, 1912. Price 3 marks.

This little book contains a succinct analysis of the German Invalidity, Sickness and Accident Laws and is intended for the use of medical men. Its value for the English reader is that it enables one to compare the general features and scope of the German system with those of our own Insurance Act. It is interesting to notice that many of the matters now or recently in dispute between the medical profession and the Government also led to friction in Germany. Pages 26 to 32 of Dr. Rumpf's book are of special interest in this connection. It will be seen that "free choice of doctor" and scales of remuneration have been serious causes of dispute elsewhere than in England. Although the book is mainly designed for medical men it can be recommended to all who wish to study the actual working of a national system of insurance.

M.G.

4.—*The cotton manufacturing industry of the United States.* By M. T. Copeland. xii + 415 pp., 8vo. Harvard University, 1912. Price \$2.

Handel und Produktion in der Baumwollindustrie. By Edgar Landauer. xi + 183 pp., 8vo. Tübingen: Mohr (Archiv für Sozialwissenschaft und Sozialpolitik herausgegeben von Edgar Jaffé), 1912. Price 5 marks 60 pf.

The cotton industry continues to exercise its fascination over investigators. In the last few years at least a dozen valuable monographs must have been penned. Of these the latest are the two works mentioned above.

Dr. Landauer confines himself to a comparatively narrow subject. He is mainly concerned with finishing—bleaching, dyeing, and printing—and the relation of these, in respect of industrial form, to manufacturing; but broadly his thesis is the relation between industrial and commercial functions and the conditions of their independent organisation. His problem is happily conceived and well worked out. Historical causes are not overlooked, as they so easily may be when an investigator sets out to discover explanations by analysis of what is. Thus, for the lesser degree of separation between bleaching and dyeing in Germany than in England, or even in Austria, he thinks historical causes are to some extent responsible. He rightly attributes the high degree of specialisation by process (both industrial and commercial) in Lancashire to the concentration of the industry, which means not merely a low cost of transport of unfinished goods passed on for another process, but also convenient marketing centres and strong local banks. But, in America, he is prepared to allow that the lesser degree of specialisation is appreciably connected with the reliance of the industry there on the home market. This judgment is borne out by Copeland, who argues that until recently the home demand was very homogeneous, and that it was its diversifying which produced the class of Merchant-Converters. But in America, of course, as we are reminded by both authors, the great bulk of the finishing is independently organised, the main cohesion which is sustained, as contrasted with division elsewhere, being that between spinning and weaving. In explaining the position of finishing all the world over, Dr. Landauer lays stress on the great variety called for, and the constant variations of demand which render close study of the market so essential, as well as on the independence of the technical processes. Concluding, he decides that though an integrating process of a vertical kind is thinkable it is by no means to be expected, so far as one can see.

Unlike Dr. Landauer's, Dr. Copeland's book does not take for its subject a relatively limited sphere. It is intended to embrace the cotton industry in all its aspects in the United States, with comparative reference to Europe. It therefore goes without saying, in view of the fact that some 400 pages only are covered, that Dr. Copeland does not fix our attention on particular problems, with a view to their thorough examination and solution, as Dr. Landauer does. Indeed the work is in the main descriptive rather than intensive—for instance, the questions raised by the United States Commissioner of Corporations in his voluminous report on the raw cotton market, though noticed, are not fully entered into. But for general purposes existing literature appears to have been adequately explored and to have been admirably supplemented by direct inquiry. The work is exceedingly useful in bringing facts up to date and presenting them in a well digested form and well arranged order. It was awarded the D. A. Wells prize and certainly goes to justify that foundation.

S.J.C.

5.—Other New Publications.*

Bagshaw (J. F. G.) and Hannaford (C. F.). Practical Banking, including Currency. A Guide to Modern Banking Practice and the Principles of Currency. viii + 507 pp., 8vo. London: Sir Isaac Pitman and Sons, Ltd., 1913. Price 5s. net.

[A clear, concise and yet comprehensive description of practical banking and of the principles of currency. It is not intended as an advanced text-book, nor does it deal with the methods of any particular bank. The authors have had varied practical banking experience in all its stages, and the book will be of much value to students of banking and also to bank officials, especially in the early years of their career.]

Brentano (Lujo). Über Syndikalismus und Lohnminimum. Zwei Vorträge. Nebst einem Anhang, enthaltend Ausführungen und Dokumente zur Illustrierung der Kampfweise der Gegner Sozialer Reform gegen deren Vertreter. 114 pp., 8vo. München: Süddeutsche Monatshefte, 1913. Price 1 mark.

[This book consists of two addresses delivered by Professor Brentano, the first dealing with the economic and social effects of Syndicalism and the means of bettering the conditions of its adherents, the other with the possibilities of a legal minimum wage. The appendix contains *inter alia* a correspondence with Sir Alfred Mond, M.P., and Lord Claud Hamilton, M.P., in regard to English trade unions.]

Clark (John Bates and John Maurice). The Control of Trusts. ix + 202 pp., 8vo. New York: Macmillan and Co., 1912. Price 4s. 6d. net.

[An enlarged edition of an earlier book, whose purpose is to advocate a positive policy for the control of trusts. Certain measures advocated and having this end in view are within the power of the executive to enforce, and they would afford the public protection against abnormal prices and improvement in the conditions of labour. The authors point out that most of the remedies proposed for the regulation of trusts fall into two classes, the first of which aims at destroying monopoly and making competition free, and the other at surrendering to the principle of monopoly and protecting the public by the official regulation of prices. The present book advocates a third course, namely, the regulation of competition; and it is hoped thereby to increase the power of production and to enlarge the social income without trenching on the legitimate claims of capital.]

Koo (I. K. H.). The Status of Aliens in China. Columbia University Studies. Vol. 50, No. 2. 359 pp., 8vo. New York: Columbia University, 1912. Price 10s.

[This book was originally intended to form an introduction to a treatise on alien claims against China, which is still in preparation. As, however, the book is fairly complete in itself, it is published apart from the larger work, and in view of the present increasing number of foreigners arriving in China its appearance is timely. The author is not aware of any work which considers the status of aliens in China, as a class, from the Chinese point of view, and has endeavoured to supply such a book.]

* See also "Additions to the Library," page 432, *sqq.*

Egypt. Plague in Egypt during the years 1899 to 1911. 83 pp., sm. 4to. Cairo: The Government Press, 1912.

[A return of the number of cases and of deaths from plague for each year from 1899 to 1911. The statistics are given for each governate, province and district, and also for the towns, villages and "nahias" where plague occurred. There is, further, a table giving the number of cases and deaths for each month, from which it would appear that the months of March, April and May are those when the disease is most prevalent.]

Germany. Mannheim. Beiträge zur Statistik der Stadt Mannheim No. 29. Verschiebungen im Mietaufwand für grossere Wohnungen 1905-10. 64 pp., 8vo. Mannheim: Franz Eyer, 1912.

[An inquiry into the housing conditions and the rents paid by various classes of the people of Mannheim during 1905-10. The proportion of rent paid to the total income of the different classes is also dealt with.]

Germany. Mannheim. Beiträge zur Statistik der Stadt Mannheim. Sondernummer. Die Opernaufführungen der deutschen Bühnen und des Gr. Hof.- und Nationaltheaters in Mannheim, 1901-11. 68 pp., 8vo. Mannheim: Mannheimer Vereinsdruckerel, 1913.

[A statistical study of the operas performed in German theatres and in the theatre of Mannheim during 1901 to 1911. As regards German theatres in general, the opera most in favour is Bizet's "Carmen," Wagner's "Lohengrin" and "Tannhäuser" coming next in popularity. The number of performances of some thirty other operas is also given.]

CURRENT NOTES.

The trade returns continue to show a further advance in value both of imports and exports. The subjoined tables compare the returns of the twelve months ending January, 1913, with the twelve months ending January, 1912:—

[000's omitted.]

Exports.	Twelve months ending February, 1913.	Twelve months ending February, 1912.	Increase (+).
	£	£	£
Exports of produce and manufactures of the United Kingdom, value f.o.b.—			
I. Food, drink and tobacco	32,651,	29,230,	+ 3,421,
II. Raw materials and articles mainly unmanufactured	59,749,	54,506,	+ 5,243,
III. Articles wholly or mainly manufactured	387,499,	363,056,	+ 24,443,
IV. Miscellaneous and unclassified (including parcel post)	10,217,	9,164,	+ 1,053,
Exports of foreign and colonial merchandise, value f.o.b.—			
I. Food, drink and tobacco	15,129,	14,453,	+ 676,
II. Raw materials and articles mainly unmanufactured	67,255,	60,657,	+ 6,598,
III. Articles wholly or mainly manufactured	29,309,	28,243,	+ 1,066,
IV. Miscellaneous and unclassified (including parcel post)	166,	136,	+ 30,
Total, British, foreign and colonial	601,975,	559,445,	+ 42,530,
Exports of bullion and specie	64,828,	57,801,	+ 7,027,

[000's omitted.]

Imports.	Twelve months ending February, 1913.	Twelve months ending February, 1912.	Increase (+).
	£	£	£
Imports, value c.i.f.—			
I. Food, drink and tobacco	281,486,	266,009,	+ 15,477,
II. Raw materials and articles mainly unmanufactured	277,949,	248,284,	+ 29,665,
III. Articles wholly or mainly manufactured	186,607,	166,961,	+ 19,646,
IV. Miscellaneous and unclassified (including parcel post)	2,931,	2,546,	+ 385,
Total merchandise	748,973,	683,800,	+ 65,173,
Imports of bullion and specie	69,670,	63,708,	+ 5,962,

[000's omitted.]

Shipping.	Twelve months ending February, 1913.	Twelve months ending February, 1912.	Increase (+).
	Tons.	Tons.	Tons.
Total, British and foreign, <i>entered</i> } with cargoes	46,451,	42,310,	+ 4,141,
Total, British and foreign, <i>cleared</i> } with cargoes	62,040,	59,982,	+ 2,058,

Mr. Sauerbeck's index number for February, as given in the *Statist*, is 86·1, as against 86·4 in January, the average of the eleven years 1867-77 being taken as 100. The advance in prices, which has been practically continuous since 1908, seems now to have reached its limit, for a time, at any rate. In September last, on the outbreak of war in the Balkans, the index number rose to 86·7, and this was the highest point. The fall in the index number would have been heavier but for a fresh advance of 2·5 per cent. in the prices of animal food. There were declines of 1·7 per cent. in vegetable food, of 1·8 per cent. in sugar, coffee and tea, and of 2·2 per cent. in minerals. On balance there was no decline in textiles. Articles of food generally were 79·4, as compared with 79·2 in January, and materials 90·9, as compared with 91·7. The *Economist* index number stands at 2,717, as compared with 2,732 in January.

According to the Board of Trade *Labour Gazette* the state of the labour market in January was as follows:—

	Trade Unions making returns. Net membership.	Reported as unemployed.	
		Number.	Percentage.
January, 1913	884,444	19,498	2·2
December, 1912	894,297	20,938	2·3
January, 1912	820,874	22,485	2·7

Employment, on the whole, continued good in January, and was better than a year ago. Employment improved in the coal mining, pig iron, iron and steel, engineering and shipbuilding trades, but there was some falling off in the tinplate, textile, pottery, and glass trades. The seasonal decline in the building and brick trades continued. The changes in rates of wages taking effect in January affected over half-a-million workpeople, whose wages were increased by nearly 27,000*l.* per week. Compared with a year ago, there was a more or less marked improvement in the pig iron, iron and

steel, engineering, textile, boot and shoe, printing, glass, pottery and brick trades. The building and woodworking trades were only slightly better. The high level which had been attained in coal-mining in January, 1912, was maintained.

A report has been issued by the London County Council on "Comparative Cost of Municipal Services." [No. 1559. Price 6d.] It is stated that the Comptroller and the Assistant Statistical Officer were instructed by the Finance Committee to report jointly (a) as to the cost of administration of services in London as compared with the cost of administration of similar services in other large towns, differentiating so far as may be possible between the cost of services performed by a central authority or by local authorities in each of the areas dealt with, and (b) generally upon the question of the economic unit of administration as applied to population of area administered for purposes of local government, with special reference to the article by Mr. C. Ashmore Baker on "Population and Costs in relation to City Management" which appeared in the JOURNAL for December, 1910. In an interesting series of tables, dealing respectively with towns above 100,000 population and 300,000 population, the net cost of the various municipal services, as well as the net cost per head of population and per pound of assessable value is given. In respect of the larger towns information is also given as to how such cost was met under each head. There are two diagrams showing (a) net cost, and (b) cost falling on rates of municipal services per head of population in towns above 100,000 population. In dealing with the relation of the cost of administration to the size of the town, the report recalls that in his article Mr. Ashmore Baker showed that with some exceptions there is a slight general increase in the cost of any given service per head of population as the sizes of towns increase; and that in the case of several services *e.g.*, salaries and superannuations, street maintenance, public lighting and sewerage there appears to be little or no direct relation between *per capita* cost and population. As a result of diagrammatic analysis of the figures for the group of county boroughs the writer observed a tendency for the cost of nearly all the services to reach a *minimum* in the group of towns whose population is in the neighbourhood of 90,000; and concluded that the governing factor for municipal expenditure was rateable value, which is also a measure of rent. The explanation was put forward "that in the "smaller towns the 'site value' per acre remains approximately "constant, and the rent is spread over a greater number of persons "as this population increases. At the point, however, at which "the centre parts of the town become loaded to their *maximum*

“capacity, probably the point at which transit facilities become a
“necessity rather than a convenience, the site value commences to
“increase rapidly, giving rise to a corresponding increase in rateable
“value and rent, which would appear to be reflected in the cost of
“all activities wherein these two factors are involved.”

The general conclusions arrived at in Mr. Ashmore Baker's article appear to be borne out by the tables accompanying the report, in which it is pointed out that the cost of administration per head of population shows an upward tendency as the size of the town increases, and dividing the towns given into two groups it is seen that the cost per head in towns of a population of 250,000 and over considerably exceeds that in towns with a population under 250,000, *i.e.*, in the former case the cost is generally over 40s. per head, and in the latter case under 40s. per head. Among the exceptions to this rule are Sheffield, Kingston-upon-Hull and Newcastle, which each show a figure less than 40s., but in the case of Sheffield and Hull, the high rates in the *l.* (9s. 7*d.* and 8s. 6½*d.* respectively, in 1910-11) have possibly a restraining effect on the development of services which might otherwise be considered necessary, and in the case of Newcastle, the total cost is reduced considerably by the receipts from municipal property. Similarly, the following towns of under 250,000 population, Cardiff, Croydon, Brighton and Halifax, show a cost per head in excess of 40s. Cardiff and Croydon, however, have an assessable value in excess of the average, which in itself is an important factor in increasing cost of administration, and Halifax is burdened with exceptionally high loan charges, being only exceeded in this respect by Manchester and Leeds. Brighton, like all seaside resorts, provides municipal services for a population much larger than its census population. In conclusion, the report points out that it must not be assumed that the division of large urban counties for the purpose of administration of service of common interest, such as education, police, fire-brigade and drainage, would result in lower cost. It is maintained that the contrary would probably be the result.

Another interesting London County Council report is that of the Education Committee on “Eight Years of Technical Education and Continuation Schools (mostly evening work).” [No. 1576. Price 2s. 6*d.*] The report deals with the work done since May, 1904, when the Council became the local education authority for London, and is divided into two parts, the first of which deals with the history and administration of these schools, and the second with the

subjects of instruction. The great expansion which has taken place in the work is clearly shown in the report. Since 1904 new or enlarged buildings account for a capital expenditure of 316,505*l.* on maintained institutions, while in respect of aided institutions building grants during the same period amounted to 75,504*l.*, in addition to 114,257*l.* allowed for the purchase of equipment, of which an appreciable proportion was required in respect of new buildings. The total expenditure incurred by maintained (technical institutes, schools of art and evening schools) and aided institutions, as well as of technical scholarships, was approximately 375,000*l.* in 1904-05, as against 485,000*l.* in 1910-11. These figures do not include grants given to the University of London, nor to the Imperial College of Science and Technology. Respecting the award of art and science scholarships, considered in another section of the report, the following table is given:—

Year.	Art.						Science.	
	Number of applications received.			Number of scholarships awarded.			Number of applications received.	Number of scholarships awarded.
	Artisans.	Non-artisans.	Total.	Artisans.	Non-artisans.	Total.		
1910....	35	55	90	16	23	39	80	11
'11....	15	58	73	7	13	20	51	15
'12....	35	60	95	17	21	38	38	9
Total	85	173	258	40	57	97	169	35

As regards the science scholarships the figures given above do not appear adequately to represent the position. It is stated that in 1910 a large proportion of the applications came from unsuitable candidates, but that in subsequent years the number of such cases has decreased. On the other hand, the fact that only 9 out of 15 scholarships were awarded in 1912 would appear to indicate that there is not a sufficiently large annual output of suitable candidates from polytechnics and technical institutes or that the value of the scholarships is not sufficiently great to induce the workers to give up their employment in order to take up the scholarships.

The *Journal of the Statistical and Social Inquiry Society of Ireland* for the Sixty-Fifth Session contains seven papers contributed since November, 1911, to the Society's transactions. In his Presidential Address, the Rev. T. A. Finlay deals historically with "Labour Associations in their relation to the State," with especial reference to the mediæval guild system. Mr. J. B. Story, in an interesting

review of English conditions, advocates the medical inspection of schools and school children in Ireland upon similar lines to those adopted by the Board of Education in Great Britain. The remaining articles include papers by Mr. D. A. Chart on "The general strike as a labour weapon," by Mr. Frederick W. Ryan on "School Attendance in Ireland," by Mr. W. Dudley Edwards on "The National Insurance Act, 1911, as applied to Ireland," and by Mr. Charles Dawson on "The Industrial Progress of Belgium."

In a recent publication (*Lancet*, December, 1912) Sir Almroth Wright, dealing generally with the methods by which certain therapeutic problems ought to be investigated, attacked the use of statistical methods with some vigour, expressing a preference for what he termed the "experiential method." By the "experiential method" "we take into account the whole complex of impressions which have been left upon the mind by experience, we arrive at a *generalisation* (which is the general law or general evaluation of the class). This will express the result which we have witnessed in the majority of our cases; and it will, if our experience is a typical one, hold good of a majority of every other series of such cases." To the statistician the "experiential method" may appear, from this description, to be strangely like the statistical method with the statistics left out. In the *Lancet*, for January 18 last, Dr. M. Greenwood takes up the cudgels in defence of the statistician, points out his functions and emphasises the importance of statistical method "in aiding us to think clearly and compelling us to express conclusions in a language which all may master if they choose."

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

Journal of the Institute of Bankers.—

January 1913—The foreign exchanges. Lectures I and II (continued in *February, 1913, issue*): *Withers (Hartley)*. The Indian Financial Management: *Spalding (W. F.)*.

February 1913—The Work of the London Bankers' Clearing House during the year 1912. Some modern phases of British Banking, 1896-1911: *Fraser (D. Drummond)*.

UNITED STATES—

American Statistical Association. (Quarterly.) December 1912—The use of averages in expressing the wages and hours of Milwaukee street car trainmen: *Secrist (Horace)*. Statistics at the Fifteenth International Congress on Hygiene and Demography held at Washington 23-28, 1912: *Willcox (Walter, F.)*.

Annals of the American Academy of Political and Social Science. January, 1913—Reciprocity: *Sifton (Clifford)*. Canada and the preference; Canadian trade with Great Britain and the United States: *Wickett (S. Morley)*. Canadians in the United States: *Wickett (S. Morley)*. The mineral resources of Canada: *Young (G. A.)*. Canadian banking: *Eckardt (H. M. P.)*. Canadian statistics. Functions and needs of our great markets: *Hays Willet (M.)*.

Journal of Political Economy. February, 1913.—Canadian banking legislation: *Weaver (S. Roy)*. Women's wages in Chicago: some notes on available data: *Abbott (Edith)*.

Quarterly Journal of Economics—

November, 1912—Agricultural development in the United States, 1900-10: *Coulter (J. L.)*. Social Denmark: *Schou (P.)*. Specialization in the woollen and worsted industry: *Held (L. D. H.)*. Fisher's Theory of Crises: a criticism: *England (M. T.)*. The origin of the National Customs-Revenue of England: *Gras (N. S. B.)*. Frankfurt-on-the-Main: a study in Prussian communal finance (continued in *February, 1913, issue*): *Youngman (Anna)*.

February, 1913—A compensated dollar (with appendix): *Fisher (Irving)*. The organization of the boot and shoe industry in Massachusetts before 1875: *Hazard (Blanche E.)*. The locomotive engineers' arbitration: its antecedents and its outcome: *Cunningham (W. J.)*. The decision on the Union Pacific Merger: *Daggett (Stuart)*.

EGYPT—

L'Égypte Contemporaine, January, 1913—The distribution of landed property in Egypt: *Craig (J. I.)*. De la modernité et de la rapidité de la justice civile en Autriche: *Caselli (E. Piola)*. Les dernières réformes introduites dans la procédure en vue d'accélérer la marche de la justice devant les juridictions indigènes: *Bey (Mohamed Hilmi Issa)*.

FRANCE—

Bulletin de Statistique, Ministère des Finances, January, 1913—La situation financière des communes en 1911. Recettes et dépenses comparées des exercices 1902 à 1911. La Caisse nationale d'assurances en cas de décès en 1911. La Caisse nationale d'assurances en cas d'accidents en 1911.

Journal des Économistes, February, 1913—La méthode et la science économique: *Guyot (Yves)*. La Banque d'Angleterre: *Jackson (Fred. Huth)*. Les conventions monétaires: *Lévy (Raphaël-Georges)*. La filature de coton: *Mondet (N.)*. Les indications d'origine et les tendances protectionnistes: *Coquet (Lucien)*.

Journal de la Société de Statistique de Paris, February, 1913—Les tempêtes de Bourse: *Neymarck (Alfred)*. Observation et stabilisation des prix: *March (Lucien)*. Éléments démographiques constitutifs de l'Empire Ottoman: *Cherrin (Dr.)*.

La Réforme Sociale, 1913—

February 1—Les taxes d'octroi et leur remplacement: *Delpech (Joseph)*.

February 16—La crise du fonctionnarisme: *Lefas (A.)*.

Revue d'Économie Politique, January-February, 1913—Le bassin de Briey et la politique de ses entreprises sidérurgiques ou minières: *Vignes (Maurice)*. La verrerie ouvrière d'Albi: *Lavergne (Bernard)*. Le renouvellement de la Convention de Bruxelles et les conditions actuelles de la production sucrière: *Hitier (Joseph)*.

Revue des Sciences Politiques, January-February, 1913—Les ports de Mannheim: *Egger (Emile)*. Les relations économiques austro-serbes: *Lagry (Gaston)*.

GERMANY—

Archiv für Sozialwissenschaft und Sozialpolitik, January, 1913—Zur Systematik und Methodologie der Forstwissenschaft: *Wappes (Dr. Lorenz)*. Die neueste Entwicklung des Syndikalismus: *Cornélissen (Christian)*. Die Juden und das Wirtschaftsleben: *Guttmann (Dr. Julius)*. Die Kaufkraft des Geldes: *Eggenschwyler (W.)*.

Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft (Schmoller's), Heft 1, 1913—Deutschland und England auf dem Weltmarkte: *Rathgen (Karl)*. Neumerkantilismus und wirtschaftliche Interessenorganisation: *Tschierschky (S.)*. Ethischer Individualismus und Soziale Reform in England: *Levy (Hermann)*. Die bevorstehende Wohnungsgesetzgebung in Preussen und im Reiche: *Seibt (Gustav)*. Die Tuberkulose-

GERMANY—*Contd.*

Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft—Contd.
 fürsorge in den Landkreisen der Rheinprovinz: *Neiden (Walter zur)*. Die Arbeitsteilung und die Beschäftigung minderwertiger Arbeitskräfte in der modernen Grossindustrie: *Heiss (Clemens)*. Der Kampf gegen Fleischnot und Fleischartung: *Waltmann (Kuno)*. Die russische Landwirtschaft und der industrielle Protektionismus: *Stryk (Gustav)*. Die automatische Kontrolle der Preispolitik staatlicher Monopolgesellschaften, erläutert am Beispiel eines Reichspetroleummonopols: *Moller (Willi)*. Der deutsche Zolltarif von 1902: *Holländer (Walter Julius)*. Das Petroleummonopol: *Schneider (Oswald)*. Neuere Arbeiten über Geldwertveränderung und Preissteigerung: *Schmöller (Gustav)*. Über die Wirtschaftsentwicklung der Karolingerzeit: *Sander (Paul)*.

Zeitschrift für Sozialwissenschaft. Heft 2, 1913—Die Mittel der äusseren Valutapolitik: *Kellenberger (Ed.)*. Das Heiratsalter im Deutschen Reich 1901-10: *Jaeckel (Reinhold)*. Das Wirtschaftsjahr 1912: *Pohle (L.)*.

Zeitschrift für die gesamte Staatswissenschaft. Heft 1, 1913—Zur Frage der Entstehung der Staaten: *Beyer (Bruno)*. Das neue Statut der Oesterreichisch-ungarischen Bank und die Theorie der Zahlung: *Neurath (Otto)*. Das Reichs-Petroleummonopol: *Trenkhorst (H.)*. Das Erscheinungsjahr von Süsmilchs Göttlicher Ordnung in den Veränderungen des menschlichen Geschlechts: *Jaeckel (Reinhold)*.

Zeitschrift für die gesamte Versicherungs-Wissenschaft. March, 1913—Die Volksversicherung als organische Ergänzung der Sozialversicherung: *Nabholz (Dr.)*. Die Versicherung gegen Berufserkrankungen in Deutschland und im Auslande: *Curschmann (Dr.)*. Der Ausbau der Invaliden- und Hinterbliebenenversicherung der Reichsversicherungsordnung: *Schönwiese*.

ITALY—

La Riforma Sociale. January, 1913—Sulla nozione del reddito imponibile: *Loria (Achille)*. La meravigliosa storia di una cantina comunale socialista: *Barnifaldi (A.)*.

MONTHLY LIST OF ADDITIONS TO THE LIBRARY.

During the period that has elapsed since February 8, 1913, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

(a) Foreign Countries.

Austria—

Elections. Berufsstatistik der Wahlberechtigten bei den Reichsratswahlen . . . im Jahre 1907. 4to. 1912. (The I. and R. Central Statistical Commission.)

Die Gewerbe-genossenschaften und deren Verbände. Kataster der Gewerbe-genossenschaften und deren Verbände. I Abteilung-. Bände 3 and 4. 8vo. 1912. (The Ministry of Commerce.)

Bosnia and Herzegovina. Die Ergebnisse der Viehzählung in Bosnien und Hercegovina vom Jahre 1910. Fol. 1912. (The Department of Statistics.)

Belgium—

Trade. Statistique du Commerce special de la Belgique avec la France la Grande-Bretagne et l'Irlande, les Pays-Bas et l'Union Douanière Allemande en 1908 et 1909 examiné au point de vue de l'origine et du degré d'achèvement des produits échangés. 226 pp., 8vo. Brussels, 1911. (The Ministry of Industry.)

Egypt—

Joint Stock Companies. Statistique des sociétés anonymes par actions travaillant principalement en Egypte au 31 Décembre 1911. La. 8vo. 1913. (The Director-General of Statistics.)

Germany—

Elections. Statistik des Deutschen Reichs, Band 250, 2. Die Reichstagswahlen von 1912. Heft. 2. 4to. 1913. (The Imperial Statistical Bureau.)

Mannheim—

Beiträge zur Statistik der Stadt Mannheim No. 29. Verschiebungen im Mietaufwand für grossere Wohnungen 1905-10. 64 pp., 8vo. 1912. (Dr. Sigmund Schott.)

Beiträge zur Statistik der Stadt Mannheim. Sondernummer. Die Opern-aufführungen der deutschen Bühnen und des Gr. Hof- und National-theaters in Mannheim, 1901-11. 68 pp., 8vo. 1913. (*Id.*)

Weltwirtschaftliches Archiv. Zeitschrift für Allgemeine und Spezielle Weltwirtschaftslehre. Band 1. Heft 1. January, 1913. 8vo. 1913. Jena. (Gustav Fischer.)

Deutsche Statistische Gesellschaft. Niederschrift der Verhandlungen der Verhandlungen der zweiten Mitgliederversammlung vom. 22. bis 23 Oktober 1912 in Berlin. 72 pp., 4to. 1913. (Purchased.)

Italy—

Census. Censimento della Popolazione al 10 Giugno 1911. Popolazione legale dei singoli Comuni del Regno . . . e popolazione di fatto. 335 pp., 8vo. 1912. (The Director-General of Statistics.)

Finance. Legge 6 Luglio 1912. No. 767 sulle Sovrimposte comunali e provinciali e sulle Spese facoltative annotata e corredata di tutti gli atti parlamentari. 256 pp., 8vo. Firenze. 1912. (The Biblioteca di Legislazione.)

(a) **Foreign Countries—Contd.****Netherlands—**

Amsterdam. Communications statistiques. No. 40. Statistique démographique des grandes villes du monde pendant, 1880-1909. 2^e Partie. 8vo. 1912. (Major P. G. Craigie.)

Norway—

Census. Recensement du 1 Décembre 1910. Finnois et Lapons. Norvégiens rentrés après avoir émigré en Amérique. Dissidents. Aveugles, sourds et aliénés. 8vo. 1912. (The Central Statistical Bureau.)

Land. Propriétés foncières rurales; années 1906 à 1910. 8vo. 1912. (*Id.*)

United States—

Agriculture, Department of. Farm Bookkeeping. 37 pp., 8vo. 1912. (The Department of Agriculture.)

— What is Farm Management? 84 pp., 8vo. 1912. (*Id.*)

— Forest Fires: Their Causes, Extent and Effects, with a summary of recorded destruction and loss. 39 pp., 8vo. 1912. (*Id.*)

— State and Municipal Meat Inspection and Municipal Slaughterhouses. 14 pp., 8vo. 1912. (*Id.*)

— Dissemination of Disease by Dairy Products, and Methods for Prevention. 8vo. 1910. (*Id.*)

— American System of Agricultural Education. 31 pp., 8vo. 1912. (*Id.*)

Census, 1910. Vol. ix. Manufactures Reports by States with Statistics for Principal Cities. 4to. 1913. (The Bureau of the Census.)

— Bulletin. Agriculture: Abstract. Farm-Crops, by States (With Statistics of purchase and sale of crops suitable for feeding animals, and of farm expenditures for labor and fertilizers). 59 pp., 4to. 1913. (*Id.*)

— Bulletin. Mining: Abstract. Statistics of Mining for Industries and States. 24 pp., 4to. 1913. (*Id.*)

— Bulletin 115. Supply and Distribution of Cotton, for the year ending August 31, 1912. 4to. 1912. (*Id.*)

Labour. Bulletin of Bureau of Labor, Whole Number 102. British National Insurance Act, 1911. 8vo. 1912. (The Department of Commerce and Labor.)

— Whole Number 103. Sickness and Accident Insurance Law of Switzerland. 8vo. 1912. (*Id.*)

— Whole Number 104. Lead Poisoning in Potteries, Tile Works and Porcelain Enamelled Sanitary Ware Factories. 8vo. 1912. (*Id.*)

Library of Congress. Publications of the Library issued since 1897. January, 1913. 8vo. 1913. (The Library.)

Minnesota. 13th Biennial Report of Bureau of Labor, Industries and Commerce, 1911-12. 8vo. 1913. (The Bureau of Labor.)

Columbia University Studies—

Vol. 50, No. 2. The status of aliens in China: *J. K. W. Koo*. 8vo. 1912. (P. S. King and Son.)

Vol. 52, No. 2. The distribution of incomes in the United States: *Frank H. Streightoff*. 8vo. New York, 1912. (*Id.*)

International—

Proceedings of International Association of Bureaus of Labor, Factory Inspection and Industrial Commissioners. 28th Annual Convention. 116 pp., 8vo. 1912. (The Director, Massachusetts Bureau of Statistics.)

(b) **India and Colonies.****India, British—**

Census of India, 1911. Volume xiv, Punjab. Part 2. Tables. Fol. 1912. (The India Office.)

— Volume xviii, Cochin. Part 1. Report. Part 2. Imperial Tables. Fol. 1912. (*Id.*)

(b) India and Colonies—*Contd.***Australia, Commonwealth of—**

- Census, 1911. Census Bulletins. 14, Mortality Investigation, 1881-1910.
15, Families. 2 parts, fol. 1912. (The Commonwealth Statistician.)
South Australia. Sixth Report of Public Actuary relating to Friendly
Societies in South Australia. Report for Quinquennial Period 1905-1909;
with Fourth Valuations of all Registered Societies as at 31st December,
1909; also Mortality and Sickness Experience of all Societies combined,
fol. 1912. (The Public Actuary.)

Canada—

- Saskatchewan*. Cheaper Money for Agricultural Development in Saskatche-
wan . . . European Systems of Co-operative Agricultural Credit. 35 pp.,
Svo. Regina, 1913. (The Department of Agriculture.)

Union of South Africa—

- Department of Agriculture. Report with Appendices for period 31st May,
1910 to 31st December, 1911. Fol. 1913. (The Government Printer.)

(c) United Kingdom and its several Divisions.

United Kingdom—

- Dominions Royal Commission. First Interim Report. [Cd-6515.] 1912.
(Purchased.)
— Minutes of Evidence. Part 1. Migration. [Cd-6516.] 1912.
(2) Part 2. Natural Resources, Trade, and Legislation. [Cd-6517.]
2 vols. 1912. (*Id.*)
Duration of Buildings for Small Holdings. Report of Departmental Com-
mittee. [Cd-6536.] 1912. (*Id.*)
Finance. First, Second and Third Reports from Committee of Public
Accounts; with proceedings of Committee, Minutes of Evidence, and
appendices. (57, 119, 156.) 1912. (*Id.*)
— Report from Select Committee on Estimates; with the Proceedings of
Committee, Minutes of Evidence and Appendices. (277.) 1912. (*Id.*)
Housing of Working Classes. (293.) 1912. (*Id.*)
India Office (Purchases of Silver). Correspondence with Bank of England
and Messrs. Samuel Montagu and Company, relating to Purchases of Silver
in 1912. (400.) 1912. (*Id.*)
Local Legislation. Special Report from Select Committee on Local Legis-
lation. (347.) 1912. (*Id.*)
Public Libraries Acts. (266.) 1912. (*Id.*)

England and Wales—

- London County Council. Report on Eight Years of Technical Education
and Continuation Schools (mostly evening work). 120 pp., fol. 1912.
(The London County Council.)
— Comparative Cost of Municipal Services. 27 pp., fol. 1912. (*Id.*)
Bradford. Chamber of Commerce. Statistics relating to Worsted and
Woollen Trades of United Kingdom including 1912. Svo. Bradford,
1913. (The Chamber of Commerce.)

Ireland—

- The Agricultural Output of Ireland. 1908. Report and Tables prepared in
connection with the Census of Production Act, 1906. 27 pp., 8vo. 1912.
(Purchased.)
Irish Linen, &c., Inquiry (Making-up Trades). Committee of Inquiry into
Conditions of Employment in Linen and other Making-up Trades of North
of Ireland. Report and Evidence. [Cd-6509.] 1912. (*Id.*)

(c) United Kingdom and its several Divisions—*Contd.***Scotland—**

Census of Scotland, 1911. Report on the Twelfth Decennial Census of Scotland. Vol. 1. Counties of Stirling, Sutherland and Wigtown. (The Registrar-General.)

Highlands and Islands Medical Service Committee. Report to Lords Commissioners of His Majesty's Treasury. Volume 1. (Cd-6559). 1912. (Purchased.)

(d) Authors, &c.

Bagshaw (J. F. G.) and Haunaford (C. F.). Practical Banking, including currency. A guide to modern banking practice and the principles of currency. viii + 307 pp., 8vo. London, 1913. (Sir Isaac Pitman and Sons.)

Borntrager (Dr. J.). Der Geburtenrückgang in Deutschland, seine Bewertung und Bekämpfung, auf Grund amtlichen und ausseramtlichen Materials. 168 pp., 8vo. Berlin, 1912. (Richard Schoetz.)

Brentano (Lujo). Über Syndikalismus und Lohnminimum. Zwei Vorträge. Nebst einem Anhang, enthaltend Ausführungen und Dokumente zur Illustrierung der Kampfweise der Gegner Sozialer Reform gegen deren Vertreter. 114 pp., 8vo. München, 1913. (Süddeutsche Monatshefte.)

Chisholm (G. G.). Bulletin of Geographical Society of Philadelphia. Vol. xi., No. 1. January, 1913. Containing article on "Malthus and some recent Census Returns." 8vo. 1913. (The Author.)

Copeland (Melvin Thomas). The Cotton Manufacturing Industry of the United States. (Harvard Economic Studies). Vol. 8. xii + 415 pp., 8vo. Cambridge (Massachusetts), 1912. (Harvard University.)

Greenwood (Dr. M., Jun.). On Methods of Research available in the Study of Medical Problems. With special reference to Sir Almroth Wright's Recent Utterances. Reprinted from *Lancet*, January 18, 1913. 26 pp., 8vo. 1913. (Dr. Greenwood.)

Haggard (F. T.). Our Agricultural Losses. 3 pp., 4to. 1913. (The Author.)

Halbwachs (Maurice). La Classe Ouvrière et les Niveaux de Vie. Recherches sur la Hiérarchie des Besoins dans les Sociétés Industrielles Contemporaines. (Bibliothèque de Philosophie Contemporaine.) 495 pp., 8vo. Paris, 1913. (Felix Alcan.)

Hobson (J. A.). Gold, Prices and Wages. With an Examination of the Quantity Theory. xi + 181 pp., 8vo. London, 1913. (Methuen and Co.)

Hutchins (B. L.). Fatigue and Efficiency. (Reprinted from the "Sociological Review," January, 1913.) 13 pp., 8vo. 1913. (The Author.)

Jaeckel (Dr. Reinhold). Statistik und Verwaltung mit besonderer Berücksichtigung der Preussischen Verwaltungsreform. 62 pp., 8vo. Jena, 1913. (Gustav Fischer.)

Kuczynski (R.). Arbeitslohn und Arbeitszeit in Europa und Amerika 1870-1909. 817 pp., la. 8vo. Berlin, 1913. (Purchased.)

Landauer (Dr. Edgar). Handel und Produktion in der Baumwollindustrie unter besonderer Berücksichtigung der lohnindustriellen Organisationsform. (Archiv für Sozialwissenschaft und Sozialpolitik.) 183 pp., 8vo. Tübingen, 1912. (J. C. B. Mohr.)

Lenoir (Marcel). Études sur la Formation et le Mouvement des Prix. 201 pp., 8vo. Paris, 1913. (Giard and E. Brière.)

Leroy-Beaulieu (Paul). La Question de la Population. iv + 542 pp., sm. 8vo. Paris, 1913. (Felix Alcan.)

Merkle (Dr. Benno). Arbeitslosigkeit, ihre statistische Erfassung und ihre Bekämpfung durch den Arbeitsnachweis. x + 121 pp., 8vo. Leipzig, 1913. (Duncker and Humblot.)

Mosse (Prof. D. M.) and Tugendreich (D. G.) (Editors). Krankheit und soziale Lage. Lief. 1. 232 pp., 8vo. München, 1912. (J. F. Lehmann's Verlag.)

Moulton (Harold G.). Waterways versus Railways. xviii + 468 pp., 8vo. Boston, 1912. (The Houghton Mifflin Co.)

(d) **Authors, &c.—Contd.**

- Norton (J. Pease)*. Comparative measurements of the changing cost of living. 12 pp., 4to. 1913. (The Author.)
- Pixley (Francis W.)*. How to read the Balance Sheet of a commercial concern. 3rd edition. 64 pp., 8vo. London, 1913. (Gee and Co.)
- Raynaud (Barthélemy)*. Vers le Salaire Minimum. Étude d'Économie et de Législation Industrielles. (Bibliothèque d'Économie Politique & de Sociologie. VI.) xi + 518 pp., 8vo. Paris, 1913. (Larose and Tenin.)
- Rozenaarad (C.)*. Table comparing Imports and Exports of Great Britain, Germany, France, Austria-Hungary, Belgium, Italy, the United States of America, Japan and Brazil for twelve months of 1912, those of Russia and Spain for eleven months with same period of 1911. Sheet, 1913. (The Compiler.)
- Schott (Sigmund)*. Die grossstädtischen Agglomeration en des Deutschen Reichs, 1871-1910. 130 pp., 8vo. Breslau. 1912. (Wilh. Gottl. Korn.)
- Sheppard (W. F.)*—
 Calculation of Moments of an Abrupt Frequency-Distribution. (International Congress of Mathematicians. Cambridge. August, 1912. 13 pp., 8vo. 1913. (The Author.)
- Reduction of Errors by Means of Negligible Differences. (International Congress of Mathematicians. Cambridge: August, 1912.) 37 pp., 8vo. 1913. (*Id.*)
- Sigerus (A.)*. Handelsbetriebsstatistik mit besonderer Berücksichtigung der Warenhandelsbetriebe. Ergänzungshefte zum Deutschen Statistischen Zentralblatt. Heft 2. 82 pp., 8vo. Leipzig. 1913. (Purchased.)
- Stevens (William S.)*, Ph.D. Industrial combinations and trusts. xiv + 593 pp. 8vo. New York, 1913. (Macmillan and Co.)
- Tenerelli (F. G.)*. Le Finanze Comunali. 450 pp., 8vo. Rome. 1913. (Società Editrice Libreria.)
- Webb (Sidney and Beatrice)*. English Local Government: The Story of the King's Highway. x + 279 pp., 8vo. 1913. (Purchased.)
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PERIODICAL RETURNS.

REGISTRATION OF THE UNITED KINGDOM.

No. I.—ENGLAND AND WALES.

MARRIAGES—To 30TH SEPTEMBER, 1912.

BIRTHS AND DEATHS—To 31ST DECEMBER, 1912.

A.—Serial Table of MARRIAGES, BIRTHS, and DEATHS, returned in the Years 1912-1906, and in the QUARTERS of those Years.

Calendar YEARS, 1912-1906:—Numbers.

Years.....	1912.	'11.	'10.	'09.	'08.	'07.	'06.
Marriages No.	—	274,577	267,721	260,544	264,940	276,421	270,038
Births..... „	872,800	881,241	896,962	914,472	940,383	918,042	935,081
Deaths „	486,982	527,864	483,247	518,003	520,456	524,221	531,281

QUARTERS of each Calendar Year, 1912-1906.

(I.) MARRIAGES:—Numbers.

<i>Qrs. ended last day of</i>	1912.	'11.	'10.	'09.	'08.	'07.	'06.
March..... No.	44,661	44,753	56,432	45,094	47,548	53,017	45,478
June „	74,365	75,516	61,036	71,829	73,502	69,782	74,420
September „	83,404	77,811	76,545	73,843	73,785	79,129	75,949
December „	—	76,497	73,708	69,778	70,105	74,493	74,191

(II.) BIRTHS:—Numbers.

<i>Qrs. ended last day of</i>	1912.	'11.	'10.	'09.	'08.	'07.	'06.
March..... No.	222,599	223,596	221,684	228,787	240,112	229,287	237,427
June „	218,096	225,796	234,825	237,220	243,834	238,535	237,168
September „	219,249	222,572	227,146	228,840	237,229	230,528	234,663
December „	212,856	209,277	213,307	219,625	219,208	219,692	225,823

(III.) DEATHS:—Numbers.

<i>Qrs. ended last day of</i>	1912.	'11.	'10.	'09.	'08.	'07.	'06.
March..... No.	144,652	143,141	136,400	160,506	156,328	160,020	140,451
June „	115,794	119,984	115,671	125,233	121,052	127,337	125,370
September „	101,675	140,954	104,149	104,786	113,929	106,813	129,397
December „	124,861	123,785	127,027	127,478	129,147	130,051	136,063

Annual Rates of MARRIAGES, BIRTHS, and DEATHS, per 1,000 PERSONS LIVING in the Years 1912-1906, and in the QUARTERS of those Years.

Calendar YEARS, 1912-1906 :—General Ratios.

YEARS.....	1912.	Mean 1902-'11.	1911.	'10.	'09.	'08.	'07.	'06.
Estmtd. Popln. of England and Wales in thousands in middle of each Year*	36,540,	—	36,164.	35,792.	35,424.	35,059.	34,699.	34,342.
Persons Mar- ried	—	15'4	15'2	15'0	14'7	15'1	15'9	15'7
Births	23'8	26'8	24'4	25'1	25'8	26'7	26'5	27'2
Deaths	13'3	15'2	14'6	13'5	14'6	14'8	15'1	15'5

QUARTERS of each Calendar Year, 1912-1906.

(I.) PERSONS MARRIED :—Ratio per 1,000.

<i>Qrs. ended last day of</i>	1912	Mean 1902-'11	1911.	'10.	'09.	'08.	'07.	'06.
March	9'8	11'3	10'0	12'8	10'3	10'9	12'4	10'7
June.....	16'3	16'4	16'8	13'7	16'3	16'8	16'1	17'4
September	18'1	17'1	17'1	17'0	16'5	16'7	18'1	17'5
December	—	16'7	16'8	16'3	15'6	15'9	17'0	17'1

(II.) BIRTHS :—Ratio per 1,000.

<i>Qrs. ended last day of</i>	1912.	Mean 1902-'11.	1911.	'10.	'09.	'08.	'07.	'06.
March	24'4	27'3	25'1	25'1	26'2	27'5	26'8	28'0
June.....	23'9	27'6	25'0	26'3	26'9	27'9	27'6	27'7
September	23'8	26'9	24'4	25'2	25'6	26'8	26'4	27'1
December	23'1	25'5	23'0	23'6	24'6	24'8	25'1	26'1

(III.) DEATHS :—Ratio per 1,000.

<i>Qrs. ended last day of</i>	1912.	Mean 1902-'11.	1911.	'10.	'09.	'08.	'07.	'06.
March	15'9	17'5	16'1	15'5	18'4	17'9	18'7	16'6
June.....	12'7	14'4	13'3	13'0	14'2	13'8	14'7	14'6
September	11'0	13'6	15'5	11'5	11'7	12'9	12'2	14'9
December	13'6	15'1	13'6	14'1	14'3	14'6	14'9	15'7

* Provisional estimates based on the results of the Censuses of 1901 and 1911.
(Unrevised.)

B.—*Special Town Table:—POPULATION; BIRTH-RATE and DEATH-RATE in each Quarter of 1912, in the NINETY-FIVE Large Towns.*

Cities and boroughs.	Estimated population in the middle of the year 1912.	Annual Rate to 1,000 Living during the thirteen weeks ending							
		30th March, 1912. (1st quarter.)		29th June, 1912. (2nd quarter.)		28th Sept., 1912. (3rd quarter.)		28th Dec., 1912. (4th quarter.)	
		Births.	Deaths.	Births.	Deaths.	Births.	Deaths.	Births.	Deaths.
Ninety-five towns*	17,639,881	25·7	16·2	25·0	13·1	24·8	11·4	24·0	14·5
<i>Including—</i>									
London†	4,519,754	25·8	15·3	24·7	12·4	24·6	11·5	23·9	15·0
West Ham	291,900	30·5	15·3	28·5	12·2	29·1	11·7	29·5	17·3
Croydon	174,257	23·2	13·0	22·1	9·8	22·5	9·3	20·4	10·3
Brighton	132,265	19·5	15·5	20·2	13·0	18·8	10·9	17·1	11·2
Portsmouth	236,731	24·4	16·0	24·8	12·8	23·8	10·9	21·9	11·8
Plymouth	112,610	22·7	18·9	21·7	13·6	21·4	12·5	21·0	14·4
Bristol	359,400	22·4	17·4	20·8	13·3	21·6	10·6	20·9	12·1
Cardiff	184,636	25·5	17·0	25·8	14·8	24·9	10·3	23·9	12·7
Swansea	117,314	29·3	16·5	28·4	12·7	27·0	10·6	25·8	13·3
Wolverhampton	95,478	26·2	16·4	26·1	12·4	24·8	11·5	24·2	13·1
Birmingham	850,947	26·5	16·4	26·1	12·6	26·3	11·0	25·7	16·2
Norwich	122,479	22·3	17·6	20·3	11·2	22·4	9·7	22·2	12·2
Leicester	229,291	21·6	16·5	22·9	11·6	22·8	10·7	21·3	14·7
Nottingham	262,563	23·2	16·9	24·4	14·6	23·0	11·6	24·1	14·7
Derby	124,545	23·6	17·0	24·9	9·8	23·9	10·7	21·7	10·8
Birkenhead	133,434	28·1	16·3	29·5	13·3	27·7	11·8	27·7	15·7
Liverpool‡	752,055	29·5	19·2	29·6	17·9	29·5	16·2	30·0	19·3
Bolton	182,533	23·5	17·9	22·0	13·2	23·2	10·1	21·1	12·6
Manchester	723,550	26·5	20·5	25·8	16·0	25·6	12·4	23·7	15·2
Salford	232,726	27·6	20·8	27·5	18·4	25·8	11·9	24·8	15·0
Oldham	148,840	23·7	19·8	22·9	17·0	22·5	12·4	23·0	15·3
Burnley	108,015	23·9	17·3	25·1	15·1	23·0	11·1	19·8	15·1
Blackburn	133,560	21·8	15·5	20·5	14·7	21·0	11·7	18·3	15·0
Preston	117,630	25·0	20·6	24·6	15·2	22·1	12·4	21·5	18·1
Huddersfield	109,511	18·3	15·9	19·1	14·0	19·8	10·7	18·3	13·9
Halifax‡	101,104	18·7	18·1	18·6	14·8	17·8	11·6	18·0	14·2
Bradford	289,618	19·0	17·0	20·0	14·1	20·2	12·1	18·2	14·1
Leeds	447,724	24·2	16·1	24·1	14·1	22·2	12·2	22·4	14·4
Sheffield	460,649	29·2	17·1	27·3	13·3	26·6	11·3	27·2	15·1
Hull	282,987	28·9	15·5	27·1	13·1	28·1	12·3	26·7	16·7
Sunderland	151,824	32·5	16·7	32·7	15·2	30·8	13·4	29·5	18·1
Gateshead	117,837	27·2	17·0	29·6	15·4	27·0	13·8	26·3	15·5
Newcastle-on- Tyne }	269,193	27·9	15·5	28·9	12·5	25·8	11·7	25·0	17·1

* The figures for the first quarter relate to 94 towns.

† Including deaths of Londoners in the Metropolitan workhouses, hospitals, and lunatic asylums outside the County of London, but excluding deaths of non-Londoners in the London Fever Hospital, the Metropolitan Asylums Hospitals, and the Middlesex County Lunatic Asylum, within the County of London. The deaths in the other towns have been similarly corrected.

‡ As extended in 1902.

C.—Comparative Table of CONSOLS, PROVISIONS, COAL, and PAUPERISM in each
QUARTER of 1910-11-12.

Cols...	1		2		3		4		5		6		7		8	
Quarter ended	Average prices of														PAUPERISM.	
	2½l. per cent. CONSOLS (for money) per 100l. Stock.*		Average minimum rate per cent. of DISCOUNT charged by the Bank of England.*		WHEAT per quarter.†		Price per pound at the Metropolitan Cattle Market (sinking the offal).‡						Average price of seaborne COAL per ton in the London market §		Average number of PAUPERS relieved on the last day of each week.	
							Beef.			Mutton.						
							In- ferior qual- ity.	Sec- ond qual- ity.	First qual- ity.	In- ferior qual- ity.	Sec- ond qual- ity.	First Qual- ity.				
1910	£	s. d.	£	s. d.	d.	d.	d.	d.	d.	s. d.	In-door.	Out-door.				
Mar. 31	81	19 0	3·52	33 1	4½	6½	7½	5½	7½	9	18 0	289,514	535,808			
June 30	81	13 11	3·72	31 8	4½	6½	7½	5½	7½	8½	16 11	271,531	510,628			
Sept. 30	81	3 7	3·02	31 10	4½	6½	7½	5½	7½	8½	15 6	261,872	499,342			
Dec. 31	79	9 5	4·63	30 5	3½	6½	7½	5	6½	8½	15 9	280,308	509,964			
1911																
Mar. 31	80	7 1	3·77	30 4	3½	5½	7	5½	7½	9	16 5	284,333	402,274			
June 30	80	19 3	3·00	31 5	4½	6½	7½	4½	7½	8½	15 9	264,262	382,804			
Sept. 30	78	1 8	3·13	31 11	3½	6½	7½	4½	6½	7½	16 3	254,632	380,161			
Dec. 31	77	18 4	4·00	32 11	3½	6½	7½	5	6½	8½	19 9	270,447	387,009			
1912																
Mar. 31	77	16 4	3·71	33 10	4½	7	8½	5½	8½	9½	21 10	282,258	411,572			
June 30	77	11 2	3·21	37 0	5½	7½	8½	5½	7½	9½	21 5	263,866	408,944			
Sept. 30	74	16 11	3·36	36 4	5½	7½	8½	5½	7½	9½	19 10	253,617	386,886			
Dec. 31	74	6 8	4·83	31 10	4½	6½	7½	5½	6½	9½	21 0	266,753	385,112			

* The prices of Consols and the Rate of Discount are furnished by the Chief Cashier of the Bank of England.

† As published by the Board of Agriculture.

‡ Furnished by the Board of Agriculture.

§ Furnished by the Mineral Statistics Department of the Home Office.

¶ Sunderland coal only.

No. II.—SCOTLAND.

BIRTHS, DEATHS, AND MARRIAGES, IN THE YEAR
ENDED 31ST DECEMBER, 1912.

I.—Serial Table :—Number of BIRTHS, DEATHS, and MARRIAGES in Scotland, and their Proportion to the Population estimated to the Middle of each Year, during each Quarter of the Years 1912-1908 inclusive.

	1912.		1911.		1910.		1909.		1908.	
	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.
<i>1st Quarter—</i>										
Births	30,272	25·6	30,710	26·1	30,422	26·1	32,373	27·9	32,503	27·9
Deaths.....	20,671	17·5	19,843	16·9	20,605	17·7	21,469	18·5	23,997	20·6
Marriages ..	6,994	5·9	6,758	5·8	7,317	6·3	7,111	6·1	7,591	6·5
<i>2nd Quarter—</i>										
Births	32,221	27·3	32,935	27·7	33,812	28·6	34,671	29·6	35,611	30·5
Deaths.....	17,728	15·0	18,027	15·2	18,593	15·8	18,478	15·8	19,499	16·7
Marriages ..	8,209	7·0	8,567	7·2	7,928	6·7	8,171	7·0	8,813	7·6
<i>3rd Quarter—</i>										
Births	30,165	25·3	29,653	24·7	30,061	25·2	31,186	26·3	32,612	27·7
Deaths.....	15,219	12·8	16,138	13·4	15,331	12·8	14,964	12·6	16,325	13·9
Marriages ..	8,778	7·4	8,434	7·0	7,975	6·7	7,777	6·6	8,044	6·8
<i>4th Quarter—</i>										
Births	30,057	25·2	28,513	23·7	29,705	24·9	30,352	25·6	30,611	26·0
Deaths.....	18,719	15·7	17,718	14·8	17,716	14·8	19,683	16·6	18,018	15·3
Marriages ..	8,529	7·1	8,052	6·7	7,616	6·4	7,033	5·9	7,135	6·1
<i>Year—</i>										
Population .			4,749,673		4,737,268		4,757,858		4,678,629	
Births			121,811	25·6	124,000	26·2	128,582	27·3	131,337	28·1
Deaths.....			71,726	15·1	72,245	15·3	74,594	15·8	77,839	16·6
Marriages ..			31,811	6·7	30,866	6·5	30,092	6·4	31,583	6·8

II.—*Special Average Table:—Number of Births, Deaths, and Marriages in Scotland and in the Town and Country Districts for each Quarter of the Year ending 31st December, 1912, and their Proportion to the Population: also the Number of Illegitimate Births, and their Proportion to the Total Births.*

Registration groups of districts.	Total Births.		Deaths.		Marriages.	
	Number.	Per 1,000 of population.	Number.	Per 1,000 of population.	Number.	Per 1,000 of population.
<i>1st Quarter—</i>						
SCOTLAND	30,272	25·6	20,671	17·5	6,994	5·9
Principal towns	14,474	26·6	9,981	18·4	3,934	7·2
Large „	4,310	28·3	2,700	17·7	940	6·2
Small „	5,809	25·6	3,604	15·9	1,132	5·0
Mainland rural	5,155	22·4	3,875	16·8	839	3·6
Insular „	524	19·3	511	18·8	149	5·5
<i>2nd Quarter—</i>						
SCOTLAND	32,221	27·3	17,728	15·0	8,209	7·0
Principal towns	15,407	28·3	8,427	15·5	4,695	8·6
Large „	4,532	29·7	2,305	15·1	928	6·1
Small „	6,163	27·1	3,231	14·2	1,335	5·9
Mainland rural	5,669	24·6	3,316	14·4	1,196	5·2
Insular „	450	16·6	449	16·5	55	2·0
<i>3rd Quarter—</i>						
SCOTLAND	30,165	25·3	15,219	12·8	8,778	7·4
Principal towns	14,121	25·7	7,257	13·2	5,239	9·5
Large „	4,160	27·0	1,904	12·4	1,135	7·4
Small „	5,892	25·7	2,797	12·2	1,381	6·0
Mainland rural	5,458	23·5	2,890	12·4	962	4·1
Insular „	534	19·4	371	13·5	61	2·2
<i>4th Quarter—</i>						
SCOTLAND	30,657	25·2	18,719	15·7	8,529	7·1
Principal towns	14,283	26·0	9,314	16·9	4,571	8·3
Large „	4,003	26·0	2,415	15·7	1,088	7·1
Small „	5,778	25·2	3,222	14·0	1,472	6·4
Mainland rural	5,446	23·4	3,398	14·6	1,288	5·5
Insular „	547	19·9	370	13·5	110	4·0

Population of Scotland.

Population.	Scotland.	Principal towns.	Large towns.	Small towns.	Mainland rural.	Insular rural.
By Census of 1911....	4,759,445	2,166,693	615,604	921,082	943,579	112,487
Estimated to the middle of 1912 }	4,738,300	2,182,400	611,500	911,400	924,000	109,000

No. III.—IRELAND.

IRELAND.—*Number of Births, Deaths and Marriages in each Province for each Quarter of 1912 and their Proportion to the Population.*

Provinces.	Births.		Deaths.		Marriages.*	
	Number.	Annual rate per 1,000 of population.	Number.	Annual rate per 1,000 of population.	Number.	Annual rate per 1,000 of population.
<i>1st quarter—</i>						
Leinster	7,007	21·2	6,240	21·5	1,648	5·7
Munster	6,094	23·6	4,543	17·6	937	3·6
Ulster	9,610	24·4	8,073	20·5	2,518	6·5
Connaught	3,715	24·4	2,509	16·5	437	2·9
Ireland	26,426	24·2	21,365	19·5	5,570	5·1
<i>2nd quarter—</i>						
Leinster	7,079	21·4	5,372	18·5	1,570	5·4
Munster	6,000	23·2	4,089	15·8	2,016	7·8
Ulster	10,056	25·5	6,931	17·6	2,119	5·4
Connaught	3,411	22·4	2,210	14·5	949	6·2
Ireland	26,546	24·3	18,602	17·0	6,654	6·1
<i>3rd quarter—</i>						
Leinster	6,651	22·9	4,341	14·9	1,630	5·6
Munster	5,651	21·8	3,352	12·9	974	3·8
Ulster	8,953	22·6	5,397	13·6	2,315	5·9
Connaught	3,161	20·7	1,852	12·1	705	4·6
Ireland	24,416	22·3	14,942	13·6	5,624	5·1
<i>4th quarter—</i>						
Leinster	6,117	21·1	4,936	17·0	1,912	6·6
Munster	5,423	20·9	3,932	15·2	1,010	3·9
Ulster	8,774	22·2	6,579	16·6	2,326	5·9
Connaught	3,182	20·8	1,919	12·6	434	2·8
Ireland	23,496	21·4	17,366	15·8	5,682	5·2
Total	100,884	23·0	72,275	16·4	—	—

* For the preceding quarter.

Population of Ireland.

	Leinster.	Munster.	Ulster.	Connaught.	Ireland.
By census of 1911 ..	1,162,044	1,035,495	1,581,696	610,984	4,390,219
Estimated to middle of 1912	—	—	—	—	4,384,636

IRELAND.

	Births.		Deaths.		Marriages.*	
	Number.	Annual rate per 1,000 persons.	Number.	Annual rate per 1,000 persons.	Number.	Annual rate per 1,000 persons.
<i>1st quarter, 1912—</i>						
Total rural districts	16,647	22·5	13,330	18·0	—	—
Total urban districts	9,779	27·6	8,035	22·7	—	—
Dublin co. borough	2,476	—	2,208	—	566	—
Belfast co. borough	2,857	—	2,362	—	850	—
<i>2nd quarter—</i>						
Total rural districts	16,610	22·4	11,982	16·2	—	—
Total urban districts	9,936	28·0	6,620	18·7	—	—
Dublin co. borough	2,437	—	1,909	—	518	—
Belfast co. borough	3,013	—	1,653	—	559	—
<i>3rd quarter—</i>						
Total rural districts	15,246	20·6	9,777	13·2	—	—
Total urban districts	9,170	25·8	5,165	14·5	—	—
Dublin co. borough	2,360	—	1,434	—	568	—
Belfast co. borough	2,606	—	1,299	—	787	—
<i>4th quarter—</i>						
Total rural districts	15,058	20·3	11,124	15·0	—	—
Total urban districts	8,438	23·7	6,212	17·6	—	—
Dublin co. borough	2,182	—	1,648	—	807	—
Belfast co. borough	2,562	—	1,808	—	854	—

* For the preceding quarter.

No. IV.—GREAT BRITAIN AND IRELAND.

SUMMARY of MARRIAGES, in the Year ended 30th September, 1912; and of BIRTHS and DEATHS, in the Year ended 31st December, 1912.

(Compiled from the Quarterly Returns of the respective Registrars-General.)

Countries.	[000's omitted.]							
	Area in statute acres.	Population middle 1912, estimated.	Marriages.	Per 1,000 of population.	Births.	Per 1,000 of population.	Deaths.	Per 1,000 of population.
		No.	No.	Ratio.	No.	Ratio.	No.	Ratio.
England and Wales }	37,338	36,539	278,927	7·63	872,800	23·88	486,982	13·32
Scotland	19,070	4,738	32,033	6·76	122,715	25·90	72,347	15·25
Ireland	20,345	4,385	23,510	5·36	100,884	23·00	72,275	16·48
Great Britain and Ireland }	76,753	45,662	334,470	7·32	1,096,399	24·01	631,604	13·83

JOURNAL

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APRIL, 1913.

Some STATISTICAL PROBLEMS SUGGESTED by the SICKNESS and MORTALITY DATA of CERTAIN of the LARGE FRIENDLY SOCIETIES.

By E. C. SNOW, M.A., D.Sc.

[Read before the Royal Statistical Society, March 18, 1913,
the President, Professor F. Y. EDGEWORTH, M.A., F.B.A., in the Chair.]

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1. THE primary motive of this paper is to indicate one or two problems of statistical interest which are, in the opinion of the writer, amenable to treatment by certain of the methods employed

by the mathematical statistician. These problems do not lend themselves very readily to reading before this Society, but many of the facts connected with them, and which provide the data for them, are of particular interest at the present time, and some account of these facts has consequently been put into the paper, and in the actual reading will receive more emphasis than the problems themselves.

Only a few of the large societies will be referred to, and these include examples from two of the *chief* types of Friendly Societies—the Affiliated Orders, and the Centralised Societies. Of the former, the data of the Manchester Unity of Oddfellows, the “Foresters,” the “Rechabites,” and the “Shepherds”—each of which issue statistical accounts relating to quinquennial periods at various intervals—have been called upon. The bulk of the information stated in those accounts is financial, but the amount of space given over to the sickness and mortality of the members is increasing. The Centralised Societies to which reference will be made are the “Hearts of Oak” and the “Rational Association.” The former publishes a statistical volume every year, while the latter issues a comprehensive report every five years. No description of the various reports need be given here, but it may be pointed out that the Centralised Societies give data for individual age-groups with little regard to geographical situation, while the Affiliated Orders give much information according to locality, but with no reference to individual age-groups.¹

2. The variations in the membership of the societies touched upon in this paper during the past twenty-five years are given in Table I:—

TABLE I.—*Adult male membership of chief Friendly Societies.*

	1885.	1890.	1895.	1900.	1905.	1910.
Manchester Unity	512,313	594,868	665,233	736,181	754,239	749,363
Foresters.....	582,104	639,728	654,628	663,232	651,681	605,971
Hearts of Oak	108,688	140,722	205,748	248,025	284,063	303,483
Rechabites.....	59,863	95,074	103,045	137,316	175,639	213,352
National Association...	54,927	72,593	77,406	89,741	98,912	95,650
Shepherds	66,941	95,947	109,782	121,064	125,026	119,693

Up to 1900, all these societies showed continuous increases in the membership. A change set in with the present century, and between 1905 and 1910 four of the six actually showed a net

¹ An account of the operations of the various societies is given in a paper by Mr. A. W. Watson, “Some Points of Interest in the operations of Friendly Societies, Railway Benefit Societies, and Collecting Societies.” *J.I.A.*, vol. xlv, p. 168 (April, 1910).

loss of members. The most satisfactory state of growth occurred in the Hearts of Oak and the Rechabites. Of the big Orders, the decline set in first in the case of the Foresters, the membership in 1910 being considerably below that of 1890. The total membership of the six societies was 1,995,600 in 1900, 2,089,600 in 1905, and 2,087,500 in 1910.

The variation in the membership of a society, however, must be considered in conjunction with the possible alteration in its age distribution. Without any information of the age distribution at all, it would probably be inferred from general considerations that some at least of the apparently satisfactory increase of membership up to 1900 was due not so much to new entrants as to the diminishing mortality of the older members. The change which has occurred in this respect can be brought out by showing for some of the societies the actual age distributions at various dates. This can be done for the Hearts of Oak, the Manchester Unity, and the Shepherds, and in Table II. the percentages of the membership in the various age-groups at different dates are shown.

TABLE II.—*Proportionate age-distribution of members.*

		-20.	20-24.	25-29.	30-34.	35-39.	40-44.	45-49.
Hearts of Oak	1892	0.48	11.58	21.20	20.91	14.79	12.97	9.27
	1900	0.25	8.89	19.15	22.69	16.57	9.66	8.48
	'10	0.08	5.41	13.22	18.43	16.58	14.97	11.10
Manchester Unity {	1892	3.43	14.86	16.20	14.61	12.13	10.29	8.56
	'97	3.45	15.11	15.88	14.27	12.22	9.97	8.26
Shepherds—								
England and Wales	1900	6.19	14.31	15.36	14.28	12.46	10.36	8.43
	'05	5.22	12.44	14.17	13.75	12.64	10.74	9.06
Scotland	1900	7.44	19.85	20.93	16.95	12.87	9.53	6.41
	'05	6.57	16.83	19.56	17.28	13.63	9.83	7.02

		50-54.	55-59.	60-64.	65-69.	70-74.	75-79.	80-.
Hearts of Oak	1892	5.40	1.82	0.88	0.47	0.17	0.05	0.01
	1900	6.63	4.64	1.95	0.65	0.31	0.10	0.03
	'10	6.58	5.65	4.16	2.55	0.93	0.24	0.10
Manchester Unity {	1892	7.00	5.18	3.34	2.00	1.36	0.70	0.34
	'97	6.76	5.47	3.90	2.34	1.27	0.72	0.38
Shepherds—								
England and Wales	1900	6.47	5.04	3.56	2.05	1.05	0.33	0.11
	'05	7.53	5.56	4.14	2.69	1.35	0.56	0.15
Scotland	1900	3.86	1.50	0.54	0.12	—	—	—
	'05	4.88	2.89	1.10	0.34	0.07	—	—

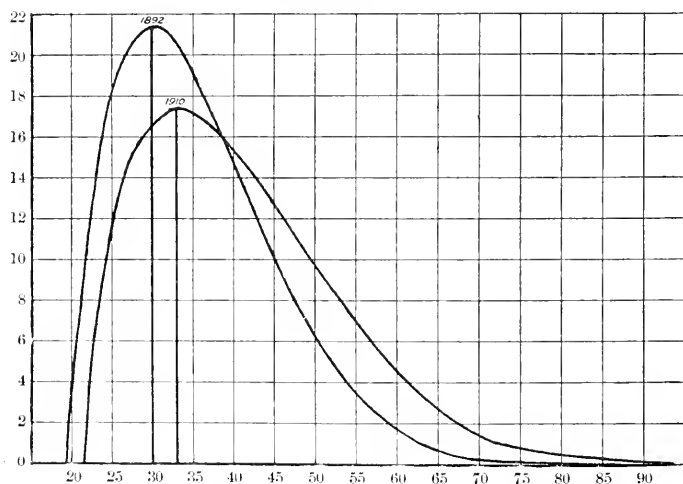
An interesting feature of the table is that the figures for Scotland in the case of the Shepherds indicate a much younger Friendly Society population there. The result of grouping the percentages in the above table into three main age-groups is given in Table III.

TABLE III.

Age-group.	Hearts of Oak.			Manchester Unity.		Shepherds.			
						England and Wales.		Scotland.	
	1892.	1900.	1910.	1892.	1897.	1900.	1905.	1900.	1905.
—40....	68.96	67.55	53.72	61.23	60.93	62.60	58.22	78.04	73.87
40—60....	29.46	29.41	38.30	31.03	30.46	30.30	32.89	21.30	24.62
60—	1.58	3.04	7.98	7.74	8.61	7.10	8.89	0.66	1.51

The figures for the Hearts of Oak are particularly instructive. Up to the beginning of the present century the movement towards a higher age distribution had not been great, but it has since proceeded at a rapid pace. The average ages of the members at the three dates mentioned were 35.18, 36.65, and 40.16 respectively. The age distribution of the Hearts of Oak for 1892 and 1910 are of sufficient interest to be graphically represented, and generalised frequency distributions have been determined to fit them.

FIG. 1.—*Age-distribution of membership of Hearts of Oak, 1892 and 1910.*²



² These are both of Pearson's Type I, or limited range in both directions, and the chief statistical constants for them are given at the end of the paper. The curves are given only for the purpose of a general graphical illustration of the change which has occurred. They do not fit the data well at early ages on account of the very quick rise, and it must be emphasised that graduation of the statistics is no part of the object in drawing the curves.

As the Manchester Unity has been used as the standard for the purposes of the National Insurance scheme, it will be useful to compare the age distribution of that Order with that of the general population. This is done in Table IV for the three main age-groups previously used.

TABLE IV.—*Comparison of age-distribution of the Manchester Unity with that of the general male population (England and Wales).*

	Manchester Unity.			
	16—40.	40—60.	60—.	Total members.
1892.....	61 ·2	31 ·0	7 ·8	596,729
1897.....	61 ·0	30 ·4	8 ·6	673,394

	General population.			
	Over 16.			Total population.
	16—40.	40—60.	60—.	
1891.....	62 ·3	26 ·9	10 ·8	8,866,000
1901.....	62 ·8	27 ·2	10 ·0	10,412,000

	16—70.			Total population.
	16—40.	40—60.	60—70.	
1891.....	64 ·8	28 ·0	7 ·2	85,24,000
1901.....	65 ·1	28 ·2	6 ·7	10,034,000

In spite of the fact that in the Manchester Unity the proportion of members between 16 and 20 was much less than the corresponding proportion in the general male population, the total proportion in the group 16—40 differed but little from that for the whole population. The general resemblance of the figures for the sample and those of the main population is rather surprising, but it would be unwise to assume that such a close relationship held between them for the Census of 1911. The age distribution of the population as disclosed by that Census has not yet been published, but the falling death and birth rates must have considerably affected it since 1901, though the alteration may not be brought out by the age-groupings here used.

The Hearts of Oak reports permit the question of the change in age distribution to be dealt with in each of the three geographical divisions—Metropolitan district, Large towns and Country districts—

in conjunction with the proportion of entrants to total members. Without giving the actual figures it may be stated that both the fall in the proportion of entrants and the increase in the average age have been appreciably less in the Country districts than in either of the other divisions, particularly in the Metropolitan district. An interesting commentary upon these facts is to be found in the population volumes relating to the recent census, in which it is pointed out that emigration has practically ceased in rural districts (0.9 per cent. between 1901 and 1911), and is now taking place to a much greater extent in small towns and to a lesser extent (but still greater than in rural parts) in large towns.

3. Space will permit of a very short account of the mortality data provided by the Friendly Societies, and only a brief description of some of those data under the headings (i) variation of mortality according to age, (ii) according to geographical position and (iii) secular variation in mortality will be given. The question of occupational mortality is entirely omitted, as the valuations referred to give little information on that important subject, which, moreover, has been treated of in various volumes by the Registrar-General.

A difficulty arises in the attempt to unravel the part played by age on mortality, since any data we have necessarily show the effects on mortality due to a complex combination of causes—geographical position, occupation, constitutional fitness, in addition to age. All we can do is to show that for a population with certain geographical position, and with certain proportions of its members in such and such occupations, &c., the variations of mortality with age are as stated. But the comparison of the mortality of this population with that of another is vitiated unless we know how these populations stand with regard to the other factors affecting mortality. We cannot, for example, in comparing the experience of the Manchester Unity for 1866-70 with that of 1893-97 given below, say that the improvement at most ages has been due to the advance in sanitation and medical knowledge unless we know that no great alteration has occurred in the proportions of members in various occupations and in geographical divisions. We tacitly assume when dealing with a population as large as that of one of the chief Friendly Societies that it is a random sample of the general male population above a certain age in respect of occupation and situation. Consequently it is not unusual for one society to use the mortality rates at particular ages of another society as its basis in calculating the deaths to be expected, implying that the occupation and geographical distributions of its members are the same as for the standard society.

Table V³ gives the mortality rates at different ages for the whole of the country for the Manchester Unity (1893-97), the Rational Association (1892-1901), and the Hearts of Oak (1883-96 and 1899-1901), and also for the same society for the ten years 1901-10. All these rates are unadjusted rates, *i.e.*, are unsmoothed by any process of interpolation. On account of the fact that the standard of mortality adopted for the purposes of the National Insurance scheme has been the English Life Table No. VI, the corresponding rates derived from the latter are also stated. The rates in each case are per 100 exposed to risk.

TABLE V.—*Comparison of death-rates in quinquennial age-groups.*

Experience.	20—24.	25—29.	30—34.	35—39.	40—44.	45—49.
Manchester Unity, 1893-97	0·37	0·46	0·55	0·70	0·96	1·18
Hearts of Oak, 1883-96 and 1899-1901	0·31	0·40	0·54	0·71	0·97	1·28
Hearts of Oak, 1901-10	0·25	0·30	0·41	0·52	0·70	0·98
Rational Association, 1892-1901	0·38	0·42	0·48	0·63	0·82	1·11
English Life-Table No. VI, 1891-1901	0·51	0·61	0·76	1·02	1·30	1·66

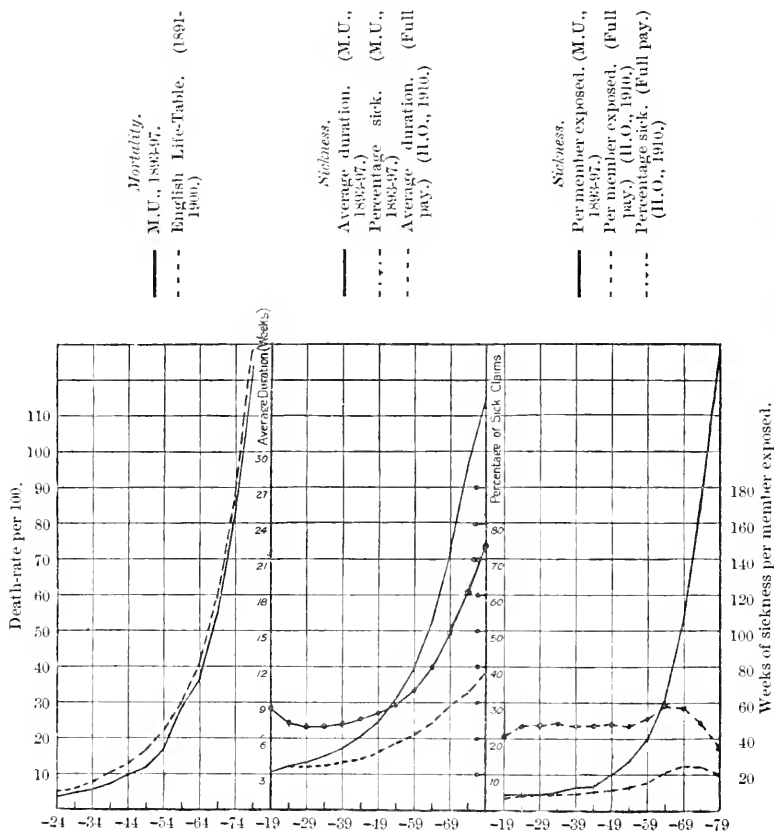
Experience.	50—54.	55—59.	60—64.	65—69.	70—74.	75—79.
Manchester Unity, 1893-97	1·70	2·84	3·63	5·48	8·20	12·32
Hearts of Oak, 1883-96 and 1899-1901	1·63	2·33	3·23	5·38	8·51	12·97
Hearts of Oak, 1901-10	1·39	2·11	3·04	4·63	7·06	10·40
Rational Association, 1892-1901	1·51	2·32	3·40	5·06	7·87	12·69
English Life-Table No. VI, 1891-1901	2·19	2·98	4·15	5·91	8·71	12·85

The chief features of this table are (*a*) the general rough resemblance of the figures in the first two rows, and to a smaller extent of these with the fourth; (*b*) the quite considerable fall in each age-group in passing from the earlier to the later experience of the Hearts of Oak and (*c*) the large excess in the death rates at most ages in the general population over those existing in the Friendly Societies dealt with. These excesses are proportionally much greater up to age 50 than beyond, and the fact that the Friendly Society population is a strictly selected one as regards

³ Though desirable in the interests of scientific accuracy the distribution of mortality according to age cannot be shown for individual localities. It will readily be appreciated that such a table as Table V *might* give quite a misleading idea of the true effect of age on mortality, since the effect of geographical situation on mortality is considerable. But as age distribution changes but little from one geographical division to another in England, the figures given may be taken as giving the true effect of age alone when other causes are allowed for.

mortality is manifest. The figures for the Manchester Unity and the English Life Table are exhibited graphically in Fig. 2.

FIG. 2.



4. In dealing with variation of mortality due to geographical causes, it is still necessary, in order to avoid possible statistical fallacies, to take account of age, and we ought strictly to investigate these variations for populations of the same age. It is probably sufficient, however, to take only three well-defined age-groups, and those already employed will be adopted. To appreciate the significance of the differences between the rates found for the three divisions of the Hearts of Oak, it will be necessary to state the probable errors. These have been found on the assumption that the exposures in each age-group form the general population in

each case, and that we have from each taken three samples, according to geographical situation.⁴

Since the "exposed" column gives the number exposed to risk of death during ten years, and the "deaths" column the total mortality in the same period, the rates are for deaths per annum, and are expressed on 100 exposed to risk per annum. The probable errors are not put in Table VI, but in Table VII is given a list of the differences of the rates for the various divisions in age-groups, and the probable errors of these differences are stated.

TABLE VI.—*Hearts of Oak. Geographical variation in mortality, 1901-10.*

Age.	Whole country.			Metropolitan.		
	Exposed.	Deaths.	Rates.	Exposed.	Deaths.	Rates.
—40	1,767,000	6,855	0·388	564,500	2,225	0·394
40—60	907,400	10,287	1·130	387,900	5,122	1·320
60—	143,600	5,820	4·040	78,700	3,162	4·020
All.....	2,818,000	22,962	0·815	1,031,150	10,509	1·020

Age.	Large towns.			Country districts.		
	Exposed.	Deaths.	Rates.	Exposed.	Deaths.	Rates.
—40	480,200	1,940	0·404	722,300	2,690	0·372
40—60	232,800	2,458	1·060	286,700	2,707	0·940
60—	30,100	1,308	4·340	34,700	1,350	3·890
All... ..	743,100	5,706	0·770	1,043,700	6,747	0·6

TABLE VII.—*Differences between rates for various divisions, with their probable errors.*

Age.	Metropolitan and Large towns.	Metropolitan and Country districts.	Large towns and Country districts.
—40.....	— 0·010 ± 0·008	+ 0·022 ± 0·007	+ 0·032 ± 0·009
40—60.....	+ 0·260 ± 0·018	+ 0·380 ± 0·020	+ 0·120 ± 0·017
60—	— 0·320 ± 0·089	+ 0·130 ± 0·085	+ 0·450 ± 0·104
All.....	+ 0·250 ± 0·009	+ 0·370 ± 0·008	+ 0·120 ± 0·009

⁴ It might, perhaps, be argued that these latter are really (geographical) sub-samples of a sample (selected by age), and that the more complicated formula for the probable error of a sub-sample of a sample should be used. But for the present purpose we are merely inquiring if the differences between the rates of the samples taken from the same age-groups are significant without comparing a sample from one age-group with one from another, and shall consequently employ the formula $\sigma^2 = \frac{pq}{n}$, the values of p and q being calculated from the experience of the whole of the age-group in each case.

In each case the positive sign is prefixed to the difference between the rates when that for the first-mentioned division is the greater. To deal with these tables in some detail. Had we given the difference in the rates and the probable errors only for all ages, we should have concluded that the mortality of the Metropolitan districts was very markedly greater than that of the Large towns. Yet in two of the three age-groups the reverse is the case, and in one of these groups (over 60) this reverse effect appears to be significant. A similar conclusion, though not so emphatically, can be drawn from the figures for the Metropolitan and Country districts. Only in the case of the 40-60 age-group is the excess mortality of the former certainly significant, and the Table appears to show very definitely that for the Hearts of Oak members the mortality for the metropolis is considerably in excess of that of the rest of the country for the age-group 40-60, but is certainly not in excess at the other age-groups. The mortality of the Large towns, however, is greater than that of the Country districts in each age-group. On the whole, the tables suggest that the geographical differentiation of mortality occurs more at the ages 40-60 than at other ages.

5. In the last section the effect of geographical position on mortality was discussed for certain main age-groups. In the present section, the actual frequency distribution of the various degrees of mortality throughout the country, when the effect due to age is allowed for, will be considered. This is rendered possible through the data given in the latest (eighth) valuation of the Manchester Unity. In that is given for practically every lodge in every district of England and Wales the mortality experienced and that expected from a knowledge of the age distribution on the basis of the 1866-70 standard. Thus an index can be formed in which the numerator is 100 times the mortality experienced and the denominator is the mortality expected, and this will indicate the effect of all causes other than age on the mortality. An index of 120 will demonstrate that the total effect of occupation, situation, constitutional fitness, etc., of the members in a particular lodge causes the mortality there to be 20 per cent. in excess of that for the whole of the society in 1866-70, the effect due to age being allowed for.

The lodges varied very considerably in number of members, some being quite small, and it was not advisable to treat of separate lodges. For this reason consecutive lodges within a district (where the lodges are arranged in order of foundation) were grouped together to form units varying in size from about 1,000 to 1,500 members. In this manner 601 units could be made out for England

and Wales, and for each of these units the mortality figures (experienced and expected) were worked up and the corresponding indices determined. The general mortality of the society in the period dealt with by the eighth valuation was much below that of the standard period, so that the total expected mortality was greater than that experienced, and a considerable majority of the indices were less than 100. The complete distribution of these is given in Table VIII. This is a normal or Gaussian distribution and is shown in Fig. 3.

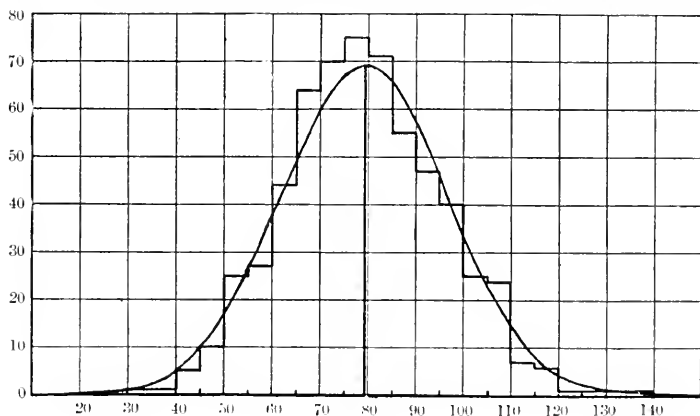
TABLE VIII.—*Frequency distribution of mortality indices due to all causes other than age. (Total 601.)**

Indices.	30—	35—	40—	45—	50—	55—	60—	65—	70—	75—	80—
Frequency	1	1	5	10	25	27	44	64	70	75	71

Indices.	85—	90—	95—	100—	105—	110—	115—	120—	125—	130—	135—
Frequency	55	47	40	25	24	7	6	1	1	1	1

* The mean and standard deviations of this distribution are 79·29 and 16·34 respectively. The generalised frequency-curve has been fitted by Pearson's method, and the statistical constants are given at the end of the Paper. Those constants determining the type of curve to be used, together with their probable errors (found from Rhind's tables), are: $\beta_1 = 0\cdot0401 \pm 0\cdot02$, $\beta_2 = 2\cdot9715 \pm 0\cdot15$. Taking account of the probable errors, it will be seen that the distribution is sensibly normal or Gaussian ($\beta_1 = 0$, $\beta_2 = 3$), the range being (theoretically) unlimited in both directions. A curve of Pearson's Type I would also be a suitable one to adopt, and in this the range is limited at both ends, but with β_1 only twice its probable error, and β_2 only deviating from 3 by one-fifth of its probable error there is every justification for taking the simpler normal curve.

FIG. 3.—*Frequency distribution of mortality indices. Manchester Unity.*



It is known that the distribution of mortality *due to all causes, including age* in a general population is far from normal (see the example given in Mr. Yule's "Introduction to the Theory of Statistics," p. 77), and although the corresponding distribution has not been worked out for the Manchester Unity material there is evidence that the same result will hold.

For reasons which will appear later, it was desirable to take as the standard of expectation of the individual areas the experience of the whole society *at the same time*, so that the total mortality experienced should be the same as the total mortality expected. Thus, an index of 120, under these circumstances, would indicate that the mortality of a particular district was 20 per cent. above that of the whole society *at the same time*. The only data given in the valuation are the expected deaths in each lodge on the basis of the standard of 1866-70, and the total deaths expected were less than those actually notified in the proportion of 80·5 to 100. To obtain the number of deaths to be expected in each lodge when the experience of the whole society in the period under review is taken as the standard would entail a very large amount of work, even if the information were available, which was not the case. An approximation to that number sufficient for *comparative* purposes will be reached, I think, by increasing the expected numbers (on the basis of the old standard), in the ratio of the total mortality experienced in the whole of the society to the total mortality expected in the whole society on the

TABLE IX.—*Distribution of modified mortality indices, due to all causes other than age. (Total 601.)**

Ratio.	40—	45—	50—	55—	60—	65—	70—	75—	80—
Frequency	1	1	3	11	11	22	21	41	56
Ratio.	85—	90—	95—	100—	105—	110—	115—	120—	125—
Frequency	47	58	58	58	48	40	33	28	22
Ratio.	130—	135—	140—	145—	150—	155—	160—	165—	170—
Frequency	18	10	6	5	—	1	1	—	1

* The mean of this distribution is at the ratio 98·28 and the standard deviation is 20·43. Thus the range of variation of mortality due to all causes other than age is greater when the whole society for the same period is made the standard of comparison than when the old standard is employed. The values of β_1 and β_2 are $\beta_1 = 0\cdot0508 \pm 0\cdot023$ and $\beta_2 = 2\cdot928 \pm 0\cdot135$. Thus the frequency curve is again Gaussian, a result which could readily have been foretold by a little mathematical reasoning from the nature of the previous one.

basis of the old standard. It can be mathematically demonstrated that this will not, in general, give the same figure as is reached if the death rate at each age-group of the whole population were applied to the corresponding age-group in the sub-population, and the summation over all the age-groups carried out, but it appears probable that in the large majority of cases this rough method will give a sufficiently good approximation *for comparative purposes*, and it has been carried out for the whole of the 601 areas. The distribution of these modified indices of mortality is given in Table IX.

The range of the distribution is very considerable, the mortality at one extreme being four times as heavy as that at the other.

6. It has already (section 3) been pointed out that the death rate of certain of the Friendly Societies is less than that shown to exist for the whole male adult population, age for age. It is of interest to investigate if the *relative* distribution of mortality according to locality is the same for the societies as for the general male population, though on a lower plane, the effect due to age being allowed for throughout. This can be conveniently done for counties, and the method adopted was as follows: From the last two decennial supplements to the Annual Reports of the Registrar-General the number of deaths which would have occurred in each registration county and in each of the standard age-groups from 15 upwards had the death rate for the whole of England and Wales for the particular age-group existed there were worked out. From these were obtained the numbers of deaths in each registration county of males over 15 which should be expected on the basis of the experience of the whole country. Indices were then formed expressing the actual number of deaths as a percentage of the expected number, and these indices give an indication of the effect of occupation, situation, etc., on the mortality of the various counties when the ratio for the whole country is taken as 100. A process similar to that of the last section has been applied to the data given for counties in the latest valuation (the only one with the information) of the Manchester Unity, and also for the last two valuations of the Foresters. The figures for the latter are not given for counties but only for individual districts according to name, and it was necessary to compile the county experience in an approximate manner from that given for the districts. Thus indices have been formed for both societies expressing the effect of all causes other than age on the mortality in counties when in each case the mortality of the whole society (England and Wales), is expressed by 100. It is not claimed that the distributions of the societies' members in counties are exactly comparable with the general populations in registration counties dealt with in the

decennial supplements, but they are sufficiently close for purposes of a rough comparison. Space is not available to show the figures for all of the counties, but a few to which reference will subsequently be made are as follows :—

	Decennial Supplement, 1881-90.	Decennial Supplement, 1891-1900.	Oddfellows. Eighth valuation.	Foresters.	
				1902 valuation.	1907 valuation.
England and Wales	100	100	100	100	100
Lancashire	126	125	123	138	127
Yorks., W. Riding	110	107	111	109	110
Glamorgan	104	105	118	111	108
Durham	99	100	107	113	113
Northumberland	107	106	109	108	106
Bucks	83	80	89	104	100
Dorset	81	83	86	91	87
Hertford	89	89	79	87	84
Wiltshire	84	84	84	93	87

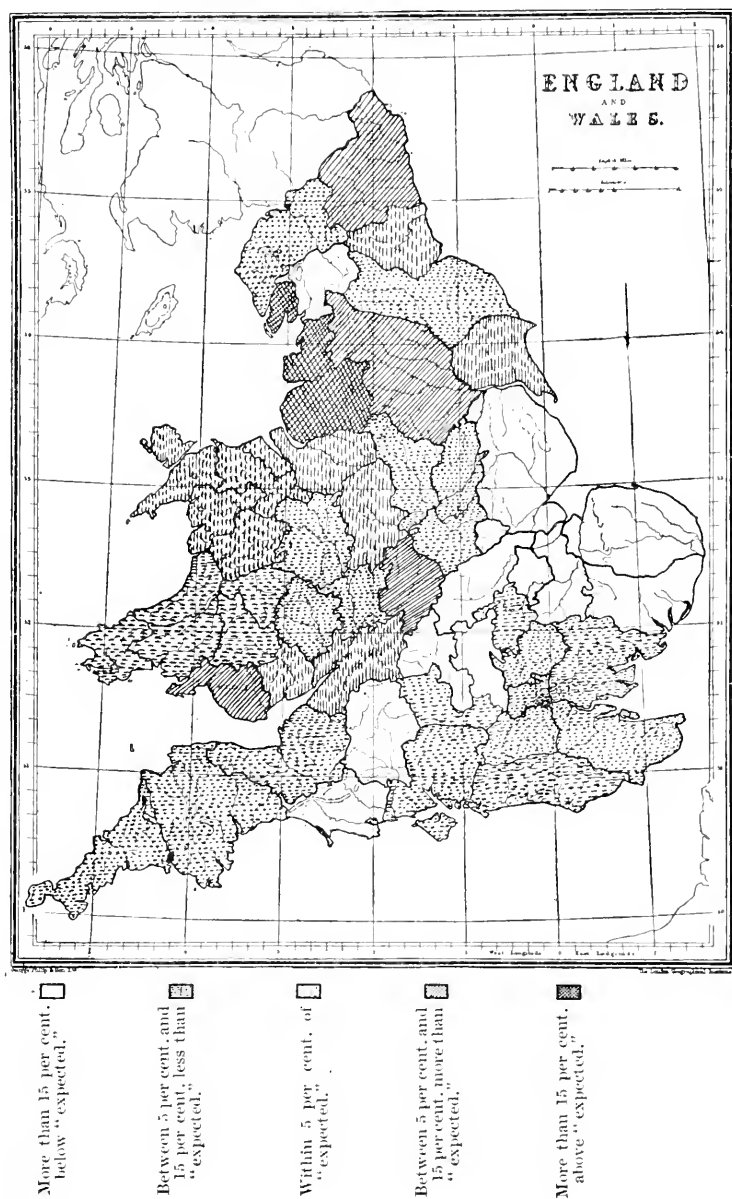
The most suitable way of indicating the extent of the agreement between the relative distributions of the whole of the counties according to mortality (when correction is made for age) is by means of correlation coefficients. These coefficients are :

Decennial Supplement (1891-1900) and Oddfellows	$r = \cdot 75 \pm \cdot 05$
" " " and Mean of Foresters'	$r = \cdot 60 \pm \cdot 07$
Oddfellows and Mean of Foresters'	$r = \cdot 71 \pm \cdot 05$

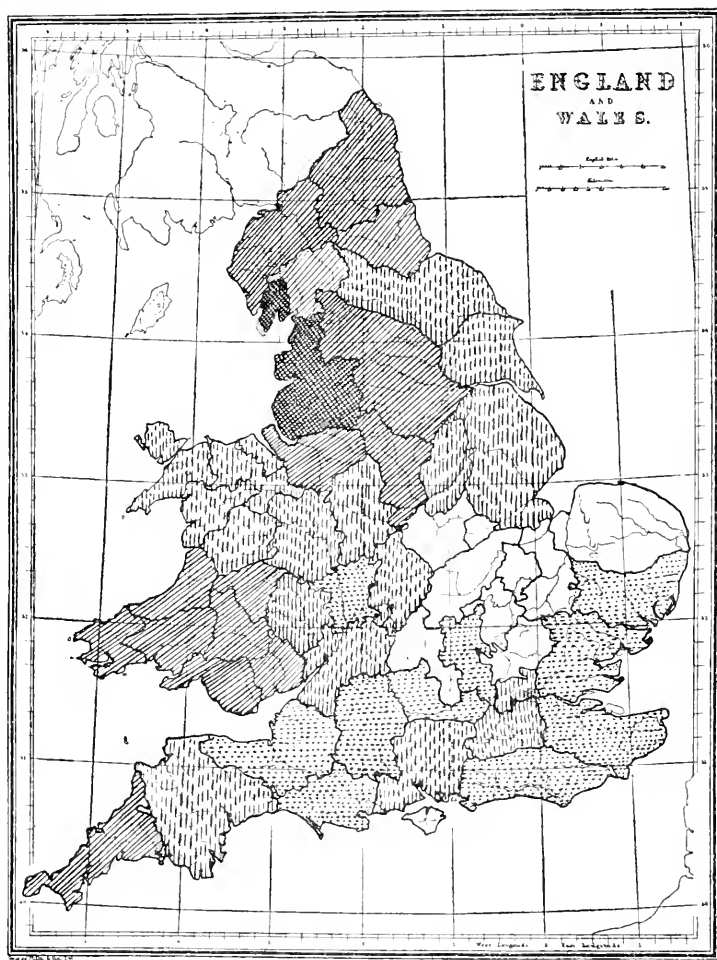
Thus the agreement between the various experiences is fairly good, and certain conspicuous cases of agreement stand out. That of Lancashire is prominent, it being very considerably the worst county in each of the experiences.

The difference between the distribution in counties of the adult male mortality in the general population and the Friendly Society population can be demonstrated by means of maps. The data for 1891-1900 have been taken to represent the relative positions of the counties with regard to general adult male mortality, and these are shown on Map I, in five grades : (i) counties with mortality—due to all causes other than age—more than 15 per cent. less than that of the whole of England and Wales ; (ii) between 5 per cent. and 15 per cent. less ; (iii) between 5 per cent. less and 5 per cent. more ; (iv) between 5 per cent. and 15 per cent. more ; and (v) over 15 per cent. in excess, and these grades are portrayed by various shadings. Lancashire is the only county falling within (v), the mortality there—when age effects are allowed for—being very markedly above that of any other county. The general features brought out by the map are the heavy mortality existing in the northern and

MAP I.—*Variation in general male mortality over 15 years due to causes other than age.*



MAP II.—*Variations in Friendly Societies' mortality due to causes other than age.*



More than 15 per cent.
below "expected."

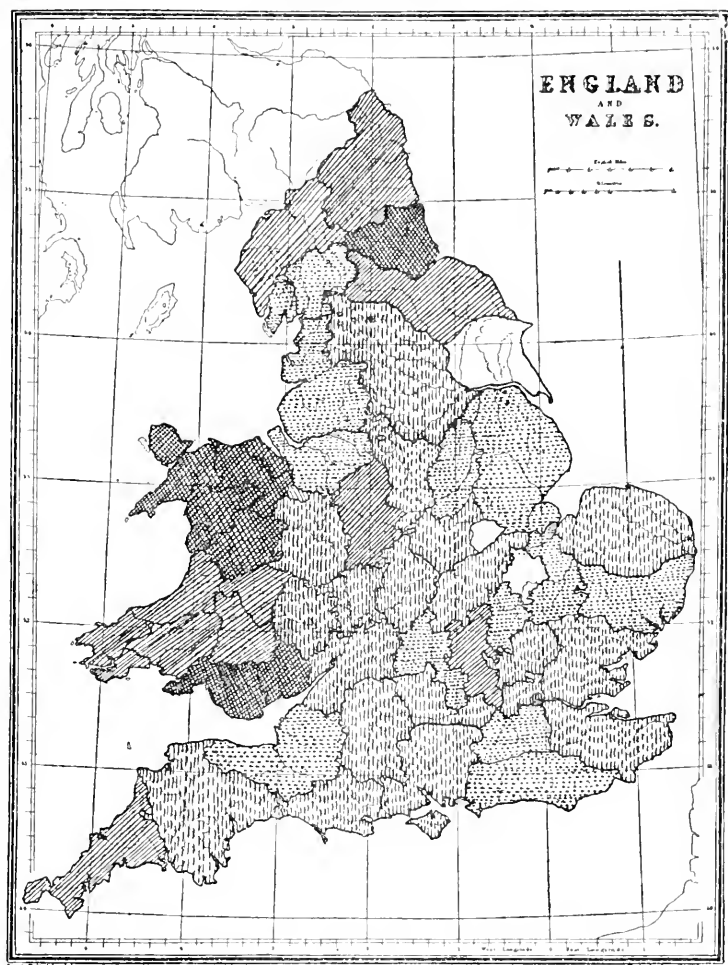
Between 5 per cent. and
15 per cent. less than
"expected."

Within 5 per cent. of
"expected."

Between 5 per cent. and
15 per cent. more than
"expected."

More than 15 per cent.
above "expected."

MAP III.—*Variations in total sickness due to causes other than age.*
Manchester Unity.



More than 15 per cent.
 below "expected."

Between 5 per cent. and
 15 per cent. less than
 "expected."

Within 5 per cent. of
 "expected."

Between 5 per cent. and
 15 per cent. more than
 "expected."

More than 15 per cent.
 above "expected."

midland counties and South Wales, and the low mortality of the eastern and southern counties. In Map II the same shading is employed to represent the relative mortality in the counties according to the joint experience of the Manchester Unity and the Foresters, the mean of the indices for the two societies being taken as a general Friendly Society index indicating the relative mortality due to all causes other than age. The general resemblance between the two distributions is evident.

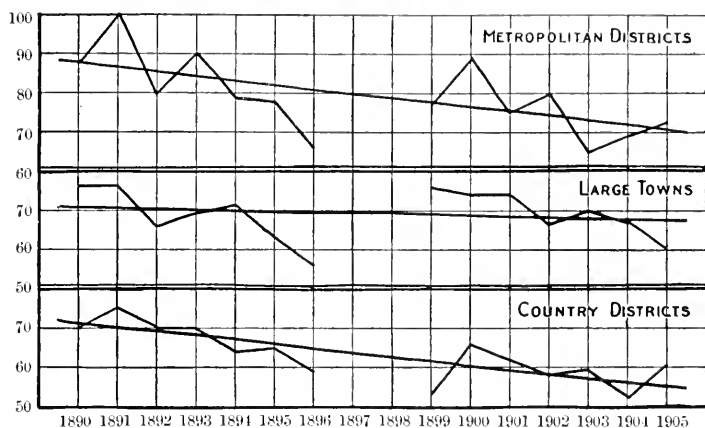
7. The secular change in mortality will be touched upon only very briefly. For this purpose the most homogeneous statistics are those of the Hearts of Oak. The data of this society enable us to follow the course of mortality from 1890 to 1905 (with the exception of the years 1897 and 1898) for the three geographical divisions in terms of a standard which remained fixed during those fifteen

TABLE X.—*Mortality indices from 1890-96 and 1899-1905.*

Year.	Metropolitan.	Large towns.	Country districts.	All.
1890.....	88	76	70	80
'91.....	101	76	75	88
'92.....	80	66	70	74
'93.....	90	69	70	79
'94.....	79	71	64	72
'95.....	78	63	65	71
'96.....	66	56	59	62
'99.....	77	76	53	69
1900.....	89	74	66	68
'01.....	75	74	62	71
'02.....	80	67	58	70
'03.....	65	70	59	64
'04.....	69	67	52	63
'05.....	72	61	60	66

years. This standard was changed in 1905 and again in 1906, and the comparison of 1905-10 with the earlier years cannot satisfactorily be made, though it was attempted. The mortality indices for the three divisions are plotted in Fig. 4, and in each case the "best fitting" straight line has been drawn.

The inclinations (regressions) of these lines give the rates at which the mortalities were falling in the period under review, and are -1.26 , -0.21 , and -1.04 per year for the Metropolitan districts, the Large towns and the Country districts, respectively. It appears then that the mortality fell least in the Large towns and most in the Metropolitan division, where it started from the highest level. The fluctuations, however, were greatest in the latter area, and were smallest in the Country districts.

FIG. 4.—*The change in mortality indices of Hearts of Oak, 1890-1905.*

8. The facts with regard to the claims for sickness benefit can be conveniently dealt with under the same heads as were used for mortality, with the addition of one showing sickness claims according to occupation. But there is a distinct statistical difference between the two cases. For mortality we merely require the number of deaths. Two elements, however, enter into the discussion of sickness claims—(a) the number of individuals sick, (b) the average duration of the claim. The method to be adopted in this paper is to treat of (a) and (b) separately whenever possible. This is expedient, for in discussing, for example, the possible increase of sickness in recent years it is desirable to know if the increase has been caused by a greater number of individuals falling sick, or by a greater duration of the claim, or by a combination of these. In each case the material will be arranged under four heads: (i) variations according to age, (ii) according to geographical position, (iii) according to occupation, and (iv) secular variation of sickness.

A few remarks should first be made concerning the comprehensive use of the term "sickness" by friendly societies. It has reference to the case of any member who receives financial benefit from his society when unable to follow his usual employment. This may be for true illness or for accident, or for other reasons, and includes the possibility of malingering beyond the period of true illness. Again, a statistical inquiry to ascertain the incidence of true sickness according to, say, occupation from the Friendly Societies' records is beset with many difficulties which the actuary does not have to worry about in the compilation of his tables. Among these is one which potently affects the statistics, viz.—that in the case of a man

with responsible duties, *e.g.*, a locomotive engine driver, a longer period of convalescence must be allowed than for a man in a less onerous occupation, and a *statistical* comparison of occupational sickness is vitiated by such considerations as this. The actuary, however, is concerned more with the number and extent of the *claims* on the societies, and it follows that an actuarial investigation into occupational morbidity, such as Mr. Watson's, only gives an approximation to the statistician who desires to compare like with like in different occupations. Further, most friendly societies include a number of individuals of higher social standing than the bulk of the members, and these are (presumably) included by the actuary in the "exposed to risk" column, but are unlikely to lay claims for benefit in respect of illness. Strictness of administration, too, considerably affects the number and extent of sickness claims. For example, the Hearts of Oak permits a member over 60 in receipt of reduced pay benefit to follow a light occupation, and Mr. Watson attributes part of the excess in reduced pay benefit noticed in this society to this cause. Again, some societies have a rule which ensures that members having received reduced sick pay must pass through a probationary period before coming on the club again. These statistical defects in the data discussed should be borne in mind in the following sections.⁵

A further matter it is necessary to mention is the distinction made by all societies in practice (though not always in their published figures) between claims for different durations. The custom varies from society to society. In the Hearts of Oak reports the figures are tabulated according to Full Pay (first 26 weeks), Half Pay (next 26 weeks) and Reduced Pay. The Manchester Unity valuation gives details of two grades only—Full Pay and Reduced

⁵ The only statistics available upon which to base an opinion of the extent to which accidents are the cause of claims for sickness benefit are contained in the latest valuation of the Foresters (for the period 1902-07) in the report of a special inquiry into the causes of excessive sickness. The results of this inquiry deserve a fuller statistical analysis than can be given here, and only the frequency distribution of the various proportions of payments which were due to accident will be shown.

Proportion per cent.	0-5	10	15	20	25	30	35	40
Frequency	10	17	17	23	13	8	7	10
Proportion per cent.	45	50	55	60	65	70	75	80
Frequency	3	1	1	2	1	1	0	1

In the whole of these 115 Courts selected on account of excessive payments for sickness, 80 per cent. of the members received sick pay during the five years,

Pay—while the Foresters have but one column for “All Sickness Pay.” In the case of the former society I understand that the custom is not uniform throughout the country, and although “Full Pay” in a large number of lodges refers to “first 26 weeks,” in others it stands for “first 52 weeks,” and in a few for the “first 13 weeks.” It is not possible, therefore, in the description of statistics in the following pages to make any uniform differentiation of the various grades of claims according to their periods. In certain cases where no confusion is likely to arise the more detailed figures will be treated of, but where comparison of societies is involved only figures for total claims can be satisfactorily discussed.

In the division of sickness claims into the two categories, say, of “first six months’ sickness” and “second six months’ sickness,” the members receiving payment under the latter have passed through the former. The figures under this head, therefore, do not indicate the true amount of short period sickness of less than six months’ total duration, but are swelled by the inclusion of what develops into long period sickness. Some idea of the extent to which “long period” sickness is included within the figures given for “first twenty-six weeks” can be obtained from the actuarial report of Neison referring to the experience of the Rechabites for the ten years 1878-87. The following figures are there given:—

Weeks of sickness claim in respect of members (874) who experienced illness of greater duration than twenty-six weeks at any time during the ten years ending December 31, 1887 (males).

	Weeks.	Days.
First six months’ sickness	23,110	2
Second six months’ sickness	16,006	4
„ twelve months’ sickness.....	11,457	5
Remainder of sickness	18,981	5
Total.....	69,556	2

and 20 per cent. of the claims and also of the payments were on account of accidents. This 20 per cent. is, of course, much above the corresponding proportion in the whole society, and the figures are given solely to emphasize the fact that the payments made by Friendly Societies in the past have included an appreciable amount for accidents, and this cannot be detached from the total paid for all claims.

It is not possible to discuss the question of malingering on a statistical foundation. The data given by the Hearts of Oak upon the results of their sickness Inspectorship system are not sufficiently detailed to enable any conclusion to be drawn as to the effect of that system, and we can only assume the likelihood of malingering without having any very exact idea of its actual extent. I believe, however, that in recent discussions the prevalence of malingering has been magnified by various speakers. At any rate, the figures of the Hearts of Oak afford no *certain* evidence of its general existence.

Claims for sickness of a "temporary nature" were made by 15,729 members, and the total number of weeks claimed by these was 110,653½. Thus $\frac{111}{134}$, or roughly four-fifths of the total weeks of sickness "under twenty-six weeks," can be attributed to "short" "period" illnesses, while one-third of the weeks of illness of a protracted nature fall within the first six months.

9. For the question of the variation in the proportion of members sick according to age, information is contained in the annual reports of the Hearts of Oak, the quinquennial valuations of the Rational Association, and the Manchester Unity experience (1893-97). The Hearts of Oak material is not comparable with those of the other two societies, nor can it be made comparable by grouping together the figures from five consecutive annual reports. For the members who are "on the club" in December of one year, and whose claim extends into the following year, would be counted twice, and this renders comparison impossible with figures dealing with five years as a single unit. Table XI shows the figures for the three societies arranged in quinquennial age-groups, those for full pay (first twenty-six weeks) in the Hearts of Oak also being given:—

TABLE XI.—*Proportion of members making sick claims, in quinquennial age-groups.*

Age-group.	Manchester Unity, 1893-97.	Hearts of Oak.				Rational Association.		
		1901.		1910.		Age-group.	1897-1901.	1902-06.
		All.	Full pay.	All.	Full pay.			
—19.....	28·6	15·7	15·6	20·5	20·5	15—18	26·7	27·2
—24.....	24·5	22·3	22·2	23·7	23·5	19—22	29·2	29·5
—29.....	23·5	23·8	23·6	24·2	23·8	—26	29·9	29·3
—34.....	23·6	25·9	25·6	24·7	24·3	—30	29·6	29·6
—39.....	24·1	25·0	24·5	24·2	23·4	—34	29·3	29·4
—44.....	25·5	23·6	22·7	24·8	23·6	—38	29·8	29·0
—49.....	27·1	24·7	23·5	25·7	24·0	—42	30·9	28·6
—54.....	29·6	28·0	26·1	26·5	23·7	—46	33·4	30·1
—59.....	33·7	33·4	29·8	30·8	25·6	—50	35·3	31·9
—64.....	39·9	40·7	32·0	41·9	29·1	—54	37·1	33·8
—69.....	49·2	52·3	33·9	54·1	28·4	—58	40·7	37·4
—74.....	60·6	68·4	29·7	68·6	24·6	—62	45·9	42·3
—79.....	73·2	82·9	25·2	84·5	17·1	—66	52·8	50·9
						—70	62·6	58·0
						—74	72·2	73·1
						—78	89·1	79·9
All*....	27·6	25·7	24·6	26·9	24·2	All*....	31·9	31·3

* This includes ages beyond the limit of the table.

The figures for the Manchester Unity are by far the most reliable, those for the first and the last two age-groups in the case of the Hearts of Oak and the last two in the case of the Rational Association being based upon comparatively few individuals (but the phenomenon of a lower sick claimant rate than for the Manchester Unity existed in *each* of the years from 1901 to 1910 for the Hearts of Oak). In the original Manchester Unity experience adjusted rates are given for every age from 16, and these show a gradual diminution in the proportion from 16 to 25, the rate being constant between 25 and 32, and varying very little between 23 and 36. The above table can be summed up sufficiently well for general purposes by the statement that the proportion of members making claim to sick benefit varies little with age up to 50, but increases rapidly afterwards. Roughly, between 25 and 30 persons out of every 100 can be expected to make claim for sickness benefit every year. In the Hearts of Oak, during 1910, 58,200 of the 60,100 claims (or 97 per cent.) for sick pay under the age of 50 were for full pay (under twenty-six weeks), compared with 14,800 of the 21,100, or 70 per cent. over that age. Information is not available to show how many of the claims to full pay at ages over 50 extend to claims for half-pay when the first twenty-six weeks are completed.⁶

10. The only available data giving details of geographical variations in the proportion of members sick are those published annually in the reports of the Hearts of Oak for the three divisions of the country previously used in this paper. As pointed out before, it will be advisable to arrange the figures in three main age-groups in order to guard against possible statistical fallacies arising through the dissimilar age distributions in the three divisions. The percentages for two separate years—1907 and 1910—have been worked out, and are shown in Table XII. 1910 is the latest year

TABLE XII.—*Numbers claiming sick-pay in main age-groups in Hearts of Oak, 1907 and 1910.*

Age-group.	Metropolitan.			Large towns.		
	1907.		1910. Percentage sick.	1907.		1910. Percentage sick.
	Number exposed.	Percentage sick.		Number exposed.	Percentage sick.	
—40....	56,043	23·5 ± ·13	22·3	50,123	28·4 ± ·13	26·6
40—60....	39,407	28·2 ± ·15	25·4	26,081	30·4 ± ·18	27·5
60—	9,089	53·1 ± ·34	49·3	3,505	55·2 ± ·54	53·5
All	104,539	27·7 ± ·09	26·7	79,709	30·2 ± ·11	28·4

⁶ The figures in Table XI for the Manchester Unity and for the Hearts of Oak (full pay) for 1910 are graphically represented in Fig. 2.

TABLE XII *Contd.*—*Numbers claiming sick-pay in Hearts of Oak.*

Age-group.	Country districts.			All.		
	1907.		1910. Percentage sick.	1907.		1910. Percentage sick.
	Number exposed.	Percentage sick.		Number exposed.	Percentage sick.	
—40....	73,009	25.7 ± .11	24.2	179,175	25.8	24.3
40—60....	30,823	27.8 ± .17	26.1	96,311	28.7	26.2
60—	3,970	51.4 ± .51	49.1	16,564	53.1	50.2
All	107,802	27.2 ± .09	26.0	292,050	28.3	26.9

for which figures are available, but it was hardly a normal year, the figures being considerably lower than those obtaining in the previous few years.

The chief point arising out of this table to be considered is the significance of the differences in the proportions of sick members in the three divisions. Probable errors are put in for the 1907 figures, and it may be taken that those for 1910 are practically the same. In calculating these it has been assumed, as before, that the whole of the members in the society in a particular age-group form a statistical population from which are taken three samples, according to geographical situation, and the probable errors have been worked out on this basis (see section 4). The actual differences in the percentages in the above table are:—

	Metropolitan and Large towns.		Metropolitan and Country districts.		Large towns and Country districts.	
	1907.	1910.	1907.	1910.	1907.	1910.
—40	-4.9 ± .18	-4.3	-2.2 ± .17	-1.9	+2.7 ± .17	+2.4
40—60.....	-2.2 ± .23	-2.1	+0.4 ± .22	-0.7	+2.6 ± .25	+1.4
60—	-2.1 ± .64	-4.2	+1.7 ± .61	+0.2	+3.8 ± .75	+4.4
All ages	-2.5 ± .14	-1.7	+0.5 ± .13	+0.7	+3.0 ± .14	+2.4

The positive sign indicates that the figure for the first-mentioned division is the highest. The necessity for dealing with individual age-groups is well brought out by a study of the column concerned with the comparison of the Metropolitan districts with the Country districts. Had we taken no account of age we should have concluded that the Metropolis was significantly worse than the Country districts. The exact reverse, however, is the case for the largest age-group (under 40), and the conclusion for "all ages" is only brought about by the fact that the proportion of members in

the three age-groups differs very considerably between the two divisions. The percentages for the Metropolitan districts, too, are quite appreciably smaller than the corresponding ones for the Large towns, and we can definitely conclude from the experience of the Hearts of Oak that the proportion of sickness claims in London is smaller than that in the remainder of the country.

Although the proportion of sick claims of members between 40 and 60 is in no case very much larger than the corresponding proportion in the group under 40, the differences are always significant, being 4.7 ± 2.0 , 2.0 ± 2.3 , and 2.1 ± 2.0 for the three divisions respectively in 1907, and not so large (but still quite significant) in 1910.

11. For the same reason as was stated in the last section, the effect of occupation on the proportion of sickness claims must be considered in the main age-groups. The only available statistics are those compiled by Mr. Watson of the Manchester Unity for 1893-97, and these have been worked up and collected in the form of Table XIII. The occupation groups employed were roughly :—

A. Agriculture.

H. The remaining rural occupations not included below.

J. The remaining urban occupations not included below.

B C D. Outdoor building trades, brick and clay workers, masons, dock labourers, and unskilled labourers working in outdoor occupations, railway servants, sea-faring, fishing, &c.

E F. Quarry workers, iron and steel workers, artisans and labourers in lead, tinplate, chemical and glass works.

G. Mining occupations.

TABLE XIII.—*Percentage of sick-claims according to occupation.*
Manchester Unity, 1893-97.

Age-group.	Occupation group.				
	A, H and J.	B, C and D.	E and F.	G.	All.
—40.....	22.1	26.8	32.9	39.1	24.1
40—60.....	26.1	31.9	37.4	45.2	28.2
60—.....	48.9	54.1	60.3	66.0	50.5
All	25.6	30.6	36.0	42.1	27.6

These figures require little discussion, since they are based on such large numbers that all the differences are statistically significant. The probable error of the differences between the proportion in the various occupations is greatest for that between occupations E F and G, and for the age-group over 60. The observed difference here is 5.7 per cent., and its probable error .51 per cent. The occupation groups are in the true order of increasing proportion of

sick claims for each of the three main age-groups. The variation is considerable. Between the worst and best occupations the number of sick claims differ by as many as 17 per 100 members.

12. For the question of the secular variation in the proportion of claims for sick benefit the only systematic data are those provided by the reports of the Hearts of Oak, and, through the kindness of Mr. C. W. Burnes and Mr. C. Davis, I was able to make use of the figures back to 1883 (with the exception of those for 1898, which have not been collected). These figures cannot be given here, but a diagrammatic representation of them is shown in Fig. 5. As pointed out in section 9, the number of sick claims per 100 exposed increases rapidly after age 50, so that figures dealing with the variation in that proportion at all ages must be interpreted with caution, as an apparent increase might be due to an alteration in age-distribution, and not to a secular change in the incidence of sick claims. Accordingly, to avoid possible fallacious inferences, the information relating to a single age-group—30-34—has been taken out, and the diagram refers to this group only. Evidence of the desirability of this procedure is given by the fact that *for all ages* the mean of the figures for the 27 years for the Metropolitan districts is 24.0 against 24.4 for the country districts, a difference of only 0.4. But for the *particular age-group* the corresponding numbers are 23.2 and 24.9, a difference of 1.7. Very considerable fluctuations will be noticed. The diagrams are entirely unlike those for the corresponding mortalities from 1890-1905 shown in Fig. 4. These latter can be represented fairly satisfactorily by straight lines, but much more complex analysis would be necessary to detect any law in the fluctuations in the number of sick claims from year to year, and the present material is not adequate enough to attempt it. A general resemblance is manifest in parts of the lines for the three divisions, and this has been numerically indicated by finding the correlation between the *changes* from year to year in the proportion of sick claimants. If

$\left. \begin{matrix} x_1 \\ x_2 \\ x_3 \end{matrix} \right\}$ denote the *change* in the proportion (per cent.) of sick claims from one year to next in $\left\{ \begin{matrix} \text{Metropolitan districts,} \\ \text{Large towns,} \\ \text{Country districts,} \end{matrix} \right.$

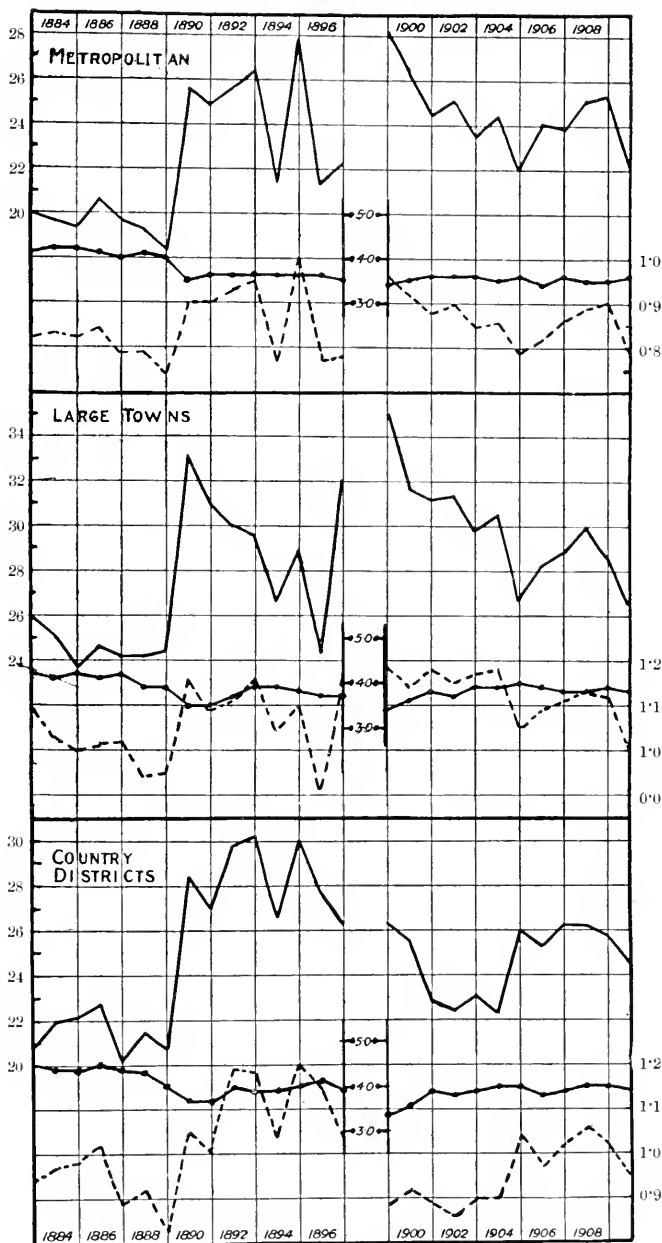
the following statistical constants are found:—

$\bar{x}_1 = +.81$	$\bar{x}_2 = +.23$	$\bar{x}_3 = +1.46$
$\sigma_1 = 30.14 \pm 2.81$	$\sigma_2 = 29.19 \pm 2.73$	$\sigma_3 = 22.92 \pm 2.14$
$r_{12} = .787 \pm .050$	$r_{13} = .626 \pm .080$	$r_{23} = .436 \pm .107$

The significance of the differences between the figures for the three divisions is shown by the following:—

$|\sigma_1 - \sigma_2| = .95 \pm 3.90$	$|\sigma_1 - \sigma_3| = 7.22 \pm 3.52$	$|\sigma_2 - \sigma_3| = 6.27 \pm 3.46$
$|r_{12} - r_{13}| = .161 \pm .09$	$|r_{12} - r_{23}| = .351 \pm .12$	$|r_{13} - r_{23}| = .190 \pm .13$

FIG. 5.—*Hearts of Oak.* Full-pay sick claim (first twenty-six weeks), age-group 30—34.



————— Percentage of sick claimants.
 - - - - - Number of weeks of sickness per member.
 Average duration of sick claim (weeks).

These numbers are based on 26 observations only, and the ordinary form of the probable errors is, therefore, only of approximate validity, and no certain conclusions can be drawn. The most reliable inference which the figures will bear is that changes in the proportion of sick claimants in the Large towns are less correlated with those in the Country districts than with those in the Metropolitan area, but even this deduction can only be put in the form of considerable probability (20 to 1). There is comparatively little relationship between the changes occurring year by year in the Country districts and those which take place at the same time in the Large towns, but there is a fairly high degree of association between these latter and those befalling in the Metropolitan area.

13. The subject of the average duration of sickness claim will be considered under the same heads as the proportion of sick claimants in the past few sections. The variations in the average duration of sickness with age are shown in Table XIV.

TABLE XIV.—*Average duration of sick claim in quinquennial age-groups.*

Age-group.	Manchester Unity, 1895-97.	Hearts of Oak.				Rational Association.		
		1901.		1910.		Age-group.	1897-1901.	1902-06.
		All.	Full pay.	All.	Full pay.			
—19.....	3·20	2·85	2·77	3·3	3·3	15—18	2·86	3·09
—24.....	3·67	3·45	3·28	4·0	3·7	19—22	3·20	3·46
—29.....	4·06	3·86	3·55	4·1	3·6	—26	3·40	3·88
—34.....	4·52	4·29	3·76	4·5	3·8	—30	3·67	4·04
—39.....	5·25	4·89	4·03	5·2	4·1	—34	4·01	4·46
—44.....	6·22	5·93	4·48	5·9	4·3	—38	4·68	4·84
—49.....	7·33	7·18	5·01	7·2	4·9	—42	4·81	5·33
—54.....	9·30	8·64	5·69	9·6	5·6	—46	5·50	5·99
—59.....	11·9	11·4	6·66	13·0	6·3	—50	6·61	6·63
—64.....	15·8	16·4	7·32	20·2	7·3	—54	8·24	8·38
—69.....	21·5	24·0	9·17	28·7	8·7	—58	10·1	10·0
—74.....	28·7	34·1	10·5	36·4	9·8	—62	14·2	12·7
—79.....	34·4	40·1	10·5	41·5	11·5	—66	16·3	16·7
						—70	21·3	21·2
						—74	27·4	26·3
						—78	32·9	33·6
All*....	8·50	6·35	4·33	8·8	4·6	All*....	5·73	6·46

* This includes ages beyond the limit of the table.

Unlike the proportion of sick claims which (section 9) remains practically constant up to age 50, the average duration of claim increases continuously from the lowest age-group. A considerable increase is evident in the average duration at almost every age-group in passing from the 1901 experience to the 1910 of the Hearts

of Oak. The increase in the average duration at all ages is deceptive, on account of the change in the age distribution which took place between those dates. The Manchester Unity figures are in excess of those of the Hearts of Oak for 1901 at all ages except those over 60, but agree very closely with those for 1910 at ages below 50.

The numbers giving the average duration of sickness claim for the Manchester Unity and for the Hearts of Oak (full-pay), 1910, are represented in Fig. 2. The general tendency is the same as already noted for the mortality line, but the upward trend is not so rapid. Comparison of the figures for the Rational Association with those of the other societies is not of much value, on account of the different age-grouping employed, but the results of the two valuations of this society show the same movement as in the case of the Hearts of Oak, viz., an increase in the average duration of the claim up to middle life, and little, if any, increase beyond the age of 50. Collating the figures given in this section with those of section 9, we can sum up in a general way by saying that the movement of sickness is in the direction of (at most age-groups) a greater average duration of claim, with little (if any) increase in the proportion of members making claims.

14. The geographical variations in the average duration of sickness claim can be discussed only for the three divisions of the Hearts of Oak, and Table XV has accordingly been drawn up on

TABLE XV.—*Average duration of sickness claim (in weeks) in main age-groups in Hearts of Oak, 1901, 1904, 1907 and 1910.*

Age-group.	1901.			1904.		
	Metro-politan.	Large towns.	Country districts.	Metro-politan.	Large towns.	Country districts.
—40.....	3·93	4·22	4·42	4·01	4·44	4·68
40—60.....	8·42	7·28	7·89	8·74	7·61	8·28
60—	20·8	23·5	24·8	22·0	23·7	25·5
All	6·82	5·93	6·01	7·78	6·60	6·68

Age-group.	1907.			1910.		
	Metro-politan.	Large towns.	Country districts.	Metro-politan.	Large towns.	Country districts.
—40.....	4·16	4·32	4·52	4·32	4·50	4·68
40—60.....	8·71	7·63	7·88	8·80	7·77	7·91
60—	22·4	25·8	23·6	26·8	27·8	26·4
All	8·90	7·12	6·84	10·8	8·08	7·55

the same basis as Table XII of section 10. The calculation of the probable errors to test the significance of the observed differences is a more difficult matter, however, in this case, and cannot be done with the data provided. Consequently, two extra independent samples, referring to the years 1901 and 1904, have been taken to support the conclusions drawn from the figures for the years 1907 and 1910.

The differences between the geographical divisions are set out below, the same convention as to sign being used as before, viz., a plus sign indicates that the first named division has the larger average duration of sick claim:—

	Metropolis and Large towns.			
	1901.	1904.	1907.	1910.
—40.....	—0·29	—0·43	—0·16	—0·18
40—60.....	+1·16	+1·13	+1·08	+1·03
60—	—2·7	—1·7	—3·4	—1·0
All	+0·89	+1·18	+1·78	+2·72

	Metropolis and Country districts.			
	1901.	1904.	1907.	1910.
—40.....	—0·49	—0·67	—0·35	—0·36
40—60.....	+0·53	+0·46	+0·83	+0·89
60—	—4·0	—3·5	—1·2	+0·4
All	+0·81	+1·10	+2·06	+3·25

	Large towns and Country districts.			
	1901.	1904.	1907.	1910.
—40.....	—0·22	—0·24	—0·20	—0·18
40—60.....	—0·61	—0·67	—0·25	—0·14
60—	—1·3	—1·8	+1·8	+1·4
All	—0·08	—0·08	+0·28	+0·53

These figures are sufficiently uniform to enable quite definite conclusions to be drawn. At ages under 40, the metropolis has the smallest average duration of sickness claim, and the Country districts the largest. In the next age-group, however, the London area has the longest average duration of claim, and the Large towns the smallest, the difference between these being quite considerable. The figures for the final age-group are not so uniform, and the Large towns and Country districts cannot be placed in a

definite order. For each of the four years, however, the Metropolitan district had the smallest average duration of sickness claim. If these numbers are compared with those in section 14, it will be noted that the Metropolis stands better than the Large towns in both average duration and in actual number of sickness claims in each age-group, except in the central group for the former, and is also generally better than the Country districts. The most noteworthy feature of the figures is the high average duration of sickness claim in the Metropolitan district in the age-group 40—60. It is much above that prevalent in the rest of the country, and is distinctly different from the experience of other age-groups.

15. For the consideration of the effect of occupation on the average duration of sickness claim, the only statistics are those relating to the Manchester Unity for 1893-97. These have been worked up into main age-groups, and are collected in Table XVI:—

TABLE XVI.—*Average duration of sickness claim (weeks) according to occupation. Manchester Unity, 1893-97.*

Age-group.	Occupation group.				
	A, H and J.	B, C and D.	E and F.	G.	All.
—40.....	4·24	4·20	4·20	4·48	4·26
40—60.....	8·45	8·43	7·83	8·71	8·42
60—	23·6	23·5	23·7	24·3	23·7
All	8·78	8·21	7·38	7·30	8·50

The group G (miners) has for each age-group the largest average duration of sickness claim, and a reference to the corresponding table in section 11 shows that this group has also the largest proportion of members making claims. The occupation of mining, then, stands worse in both aspects of sickness—number of claims, and average duration of claim. Apart from this group, there is very considerable uniformity in the above figures, the only exception being for group E and F (quarrying, &c.) at age 40—60, and here the average duration of claim is about four days per annum *less* than that of the whole population. The agreement between the other figures which are comparable is very close, and the variations in the table are quite unlike those found in Table XV, when average duration of sick claim was arranged according to geographical situation. It would appear from the evidence here collected that Mr. Watson's oft-quoted conclusion that occupation has a greater effect upon the amount of sickness in a population than has geographical position may be stated in greater detail as follows: *occupation produces the greater variations in the proportion of sick*

claims, but *geographical situation* produces the greater variations in the *average duration of the claim*; the former is more potent than the latter, so that occupation affects the *total* amount of sickness in the population to a greater extent than does situation.

16. The information of the secular change in the average duration of sick claim can only be given diagrammatically in the same manner as was the secular change in the proportion of claims in section 12. The fluctuations from year to year are shown in Fig. 5, and, as before, refer only to the age group 30—34, and for full pay (first 26 weeks) sick claim. We should expect in a rough sort of way an inverse relationship to hold between the line showing average duration and that giving the proportion of claimants to benefit, since in an epidemic year (*e.g.*, 1890), when the number of members making claims is considerably increased, the denominator of the fraction giving the average duration is increased in a greater proportion than is the numerator, and this is seen to be the case. Since 1890 the average duration of sick claim (full pay) has been remarkably constant in the Metropolitan district. It will be noticed that changes from year to year in the average duration of claim are, on the whole, associated with each other for the three divisions (particularly for the Large towns and the Country districts), but it hardly seems necessary to work out a numerical coefficient of the degree of this association (as in section 12), since average duration of sick claim is a complex item and the interpretation of a numerical measure of association in such a case is not a simple matter. The line for the Metropolitan districts is invariably the lowest, and that for the Country districts is usually the highest in the figure. For the proportion of members sick the line for the Large towns is usually the highest and that for London generally the lowest.

17. We now come to the consideration of the *total* amount of sickness experienced by the various Friendly Society populations. It will still be convenient to deal with this subject under the same heads as before, and the figures showing the effect of age are first given. This is by far the most important aspect of the matter from the point of view of the actuary, who requires to know the total amount of sickness to be expected and not so much the number of individuals who are likely to make claims. Following the method employed in section 9 and section 13, Table XVII shows the number of weeks of sickness per annum per member exposed to risk in quinquennial age-groups. Each number is, of course, the product of the corresponding numbers in Tables XI and XIV.

The figures in the first column of this table are of particular interest at the present time, since they represent in quinquennial age periods the rates which at individual ages are the basis of the

TABLE XVII.—*Weeks of sickness per member per annum in quinquennial age-groups.*

Age-group.	Manchester Unity, 1893-97.	Hearts of Oak.				Rational Association.		
		1901.		1910.		Age-group.	1897-1901.	1902-06.
		All.	Full pay.	All.	Full pay.			
—19.....	·91	·45	·43	·68	·68	15—18	·76	·84
—24.....	·90	·77	·73	·94	·86	19—22	·93	1·02
—29.....	·95	·92	·84	·98	·85	—26	1·02	1·13
—34.....	1·07	1·11	·96	1·12	·92	—30	1·09	1·20
—39.....	1·27	1·22	·99	1·25	·95	—34	1·17	1·31
—44.....	1·33	1·39	1·02	1·46	1·03	—38	1·40	1·36
—49.....	1·99	1·78	1·18	1·86	1·17	—42	1·48	1·52
—54.....	2·75	2·42	1·49	2·55	1·33	—46	1·83	1·81
—59.....	4·01	3·81	1·99	3·99	1·60	—50	2·33	2·11
—64.....	6·30	6·69	2·34	8·46	2·12	—54	3·06	2·83
—69.....	10·58	12·54	3·11	15·48	2·48	—58	4·11	3·73
—74.....	17·39	23·35	3·11	25·03	2·41	—62	6·53	5·37
—79.....	25·18	33·22	2·65	35·09	1·97	—66	8·62	8·52
						—70	13·35	12·32
						—74	19·70	19·21
						—78	29·53	26·91
All*....	2·34	1·63	1·07	2·37	1·11	All*....	1·83	2·02

* This includes ages beyond the limit of the table.

sickness part of the National Health Insurance scheme. They are graphically represented in Fig. 2 (*ante*), and from that diagram a general idea can readily be obtained of the rate at which sickness increases with age. If the rates for each group of the Manchester Unity and Hearts of Oak are compared, quite a good agreement will be noticed, except in the first and last three groups (and these, in the Hearts of Oak, are based upon comparatively few observations). Up to age 30 the rate, in the Hearts of Oak, for full pay is but little below that for all-pay, but the difference increases rapidly at higher ages. At ages over 70 the claims for full pay are but a small portion of the whole, and the amount of the former appears, if anything, to diminish. This is not improbable, as with a considerable portion of the population over that age "on the club" for reduced pay, the portion exposed to risk for full pay is reduced also, and consequently there is a limit beyond which the rate for full pay cannot reach.

18. Many more data are available for the discussion of the effect of geographical situation on the total amount of sickness than were procurable concerning the effect on the number of sick claimants and also on the average duration of the claim, and these will be considered in some detail. We shall first briefly deal with the variations in the three divisions of the Hearts of Oak after the manner of sections

TABLE XVIII.—*Number of weeks of sickness per member exposed in Hearts of Oak, 1907 and 1910.*

Age-group.	Metropolitan.		Large towns.		Country districts.		All.	
	1907.	1910.	1907.	1910.	1907.	1910.	1907.	1910.
—40....	0·98	0·96	1·23	1·20	1·16	1·13	1·10	1·12
40—60....	2·46	2·24	2·32	2·14	2·19	2·06	2·34	2·14
60—	11·90	13·20	14·20	14·90	12·10	13·00	12·40	13·50
All	2·47	2·88	2·15	2·29	1·86	1·96	2·16	2·37

10 and 14. Table XVIII shows the amount of sickness per member exposed in each of the three divisions in the main age-groups. This contains further instances of how quite fallacious inferences might have been drawn had the material not been divided into age-groups. Confining attention to the group under 40, it would appear from the figures for the whole society that the sickness rate had slightly increased from 1907 to 1910 while, as a matter of fact, in each of the three geographical divisions it had diminished, the effect being produced by changes in the relative proportions of members in the three divisions. In all cases the results for 1910 support the conclusions to be drawn from the 1907 figures as to the differences in total sickness per member according to geographical situation. For the first age-group the order is Metropolitan districts, Country districts and Large towns in ascending scale. In the second the order is Country districts, Large towns, Metropolitan districts, while in the third there is practically no difference between the London area and the Country districts, but the position of the Large towns is much inferior. These conclusions could, to some extent, have been anticipated from the figures given in section 10 and section 14, and should be read in conjunction with these sections; it will then be noticed, for example, that the superiority of the metropolitan district in the first age-group arises in part from a smaller proportion of sickness claims and in part also from a smaller average duration of claim.

19. The data in the latest valuation of the Manchester Unity, referred to in section 5, allow of the geographical distribution of sickness throughout England and Wales being dealt with in detail. For most of the lodges are shown the amount spent on sickness both for full pay and reduced pay, and the corresponding amounts which were expected on the basis of the 1866-70 experience. These lodges have been, for the purposes of this paper, grouped together into "units," as described in section 5, and the cost of sick pay (expected and actual) both "full" and "reduced" aggregated

for each unit. Then indices have been formed which indicate the effect of all causes *other than age* affecting sickness, both for "full pay" sickness and for "reduced pay" sickness. The aggregate actual "full pay" throughout the country was practically equal to the corresponding "expected" amount, but the actual "reduced pay" was 55 per cent. in excess of that "expected" on the basis of the 1866-70 experience. As before stated, 601 of the "units" were formed, and the nature of the distribution of the "full pay" sickness indices throughout these is given in Table XIX:—

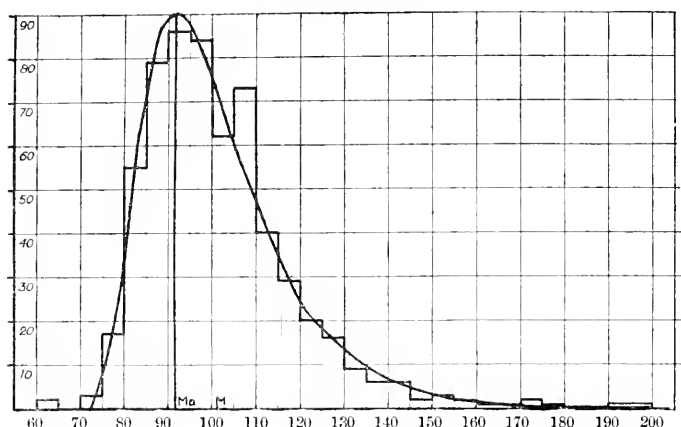
TABLE XIX.—*Distribution of "full pay" sickness index throughout England and Wales.**

60—61.	65—69.	—74.	—79.	—84.	—89.	—94.	—99.	—104.	—109.
2	—	3	17	55	79	86	84	62	73
—114.	—119.	—124.	—129.	—134.	—139.	—144.	—149.	—154.	
40	29	20	16	9	6	6	2	3	
—159.	—164.	—169.	—174.	—179.	—184.	—189.	—194.	—199.	
2	1	1	2	1	—	—	1	1	

* The mean, standard deviation, mode and skewness of this distribution are 101·56, 17·24, 91·28, and ·597 respectively. Pearson's method has been employed to fit the generalised frequency curve to these figures, the statistical constants for determining the nature of the curve being $\beta_1 = 2·377$ and $\beta_2 = 7·318$. These are high values, and fall outside Rhind's Diagram A, but if the lines in this are extended a little it is readily seen that the distribution lies well in the area covered by Pearson's Type VI, and accordingly this curve has been fitted to the statistics, the equation and further constants being given in the Appendix.

Type VI is a curve with limited range in one direction, and unlimited (theoretically) in the other. In this case the curve commences at the ratio 73·12, so that an outlier 2 at 62·5 is left outside the curve. Of course, we are not sure that we are dealing with really homogeneous material, and it is possible that the two "units"—the whole of the Altrincham district of Cheshire and the major portion of the Uttoxeter district of Staffordshire—contain a larger proportion than usual of honorary members referred to in section 8. At any rate, the curve suggests that there is something exceptional about these two units. For reduced sick pay the corresponding indices are high — 171 and 214 respectively, against 155 for the whole society. Their mortality indices, too, are above those of the whole society.

This distribution is represented in Fig. 6, and the skewness is considerable.

FIG. 6.—*Frequency distribution of "full-pay" sickness, corrected for age. Manchester Unity.*

The corresponding distribution for "reduced pay" sickness ratio is shown in Table XX:—

TABLE XX.—*Distribution of "reduced pay" sickness ratio throughout England and Wales.**

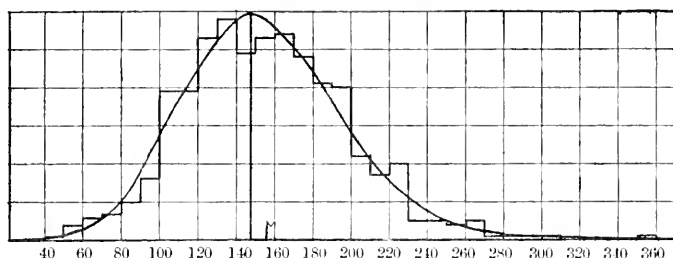
45—49.	50—54.	—59.	—64.	—69.	—74.	—79.	—84.	—89.	—94.	—99.	—104.	—109.
1	2	2	4	2	3	4	5	5	6	10	15	24
—114.	—119.	—124.	—129.	—134.	—139.	—144.	—149.	—154.	—159.	—164.	—169.	—174.
18	21	26	27	32	26	28	21	26	27	26	28	27
—179.	—184.	—189.	—194.	—199.	—204.	—209.	—214.	—219.	—224.	—229.	—234.	—239.
21	23	18	20	20	11	11	9	8	15	5	3	2
—244.	—249.	—254.	—259.	—264.	—269.	—274.	—279.	—284.	—289.	—294.	—299.	—304.
3	2	1	3	4	1	1	—	1	—	1	—	1

* The mean, standard deviation, mode and skewness are 155.62 , 42.95 , 148.16 , and $.174 \pm .033$ respectively. The skewness is thus much smaller than in the previous distribution, but is almost certainly significant. The parameters fixing the type of curve fitting the above crude figures are $\beta_1 = .190 \pm .092$, $\beta_2 = 3.712 \pm .46$, and the curve is consequently of Type IV—unlimited range in both directions, though, as indicated by the probable errors, such a distribution might arise from a true normal frequency. The equation and further statistical constants are given in the Appendix.

This distribution is quite dissimilar to the last, and the range is about twice that there found. Before dealing with it, further grouping was performed, the unit being doubled.

It is represented in Fig. 7, the skewness being much less than in the last distribution.

FIG. 7.—*Frequency distribution of "reduced pay" sickness, corrected for age (Manchester Unity).*



A similar distribution might be given to indicate the variations throughout the country of the *total* amount of sickness. This has not been constructed, but it is clear that it will be quite skew and approach the first of the above distributions rather than the second, since the "full pay" sickness is about three-quarters of the total.

20. The data in the latest valuation of the Manchester Unity enable us readily to deal with the distribution of sickness in counties. The reports of the Foresters also permit of the sickness cost (actual and expected) being arranged approximately in counties, but only for total sickness. But the standards are not the same for the Foresters and the Manchester Unity, and they cannot be compared in the original state. The difficulty can be obviated in an approximate way by expressing the figure for each county in terms of that of the *whole* society to which it belongs as the standard, in the same manner as that employed to modify the mortality ratio in section 5. Thus the index 115 for the Monmouth membership of the Manchester Unity indicates roughly that, when correction is made for age, the total sickness of the Oddfellows in that county was 15 per cent. in excess of that to be expected from the experience of the whole society for the same period. The counties can in this manner be arranged in a general sort of order according to the sickness incurred, and this order will be comparable with that obtained in a similar way for the Foresters. For the Manchester Unity indices have been worked out for "full pay," "reduced pay," and for "total pay." For the Foresters "total pay" only can be given, but for each of the last two valuations (1902 and 1907). These are shown below for

the same counties for which the corresponding mortality indices have been given.

	Manchester Unity.			Foresters. Total pay index.	
	Full pay index.	Reduced pay index.	Total pay index.	1902.	1907.
England and Wales	100	100	100	100	100
Lancashire	97	89	95	93	97
Yorks, West Riding	102	91	99	96	101
Glamorgan	130	126	129	119	121
Durham	125	129	126	111	106
Northumberland	107	135	115	153	134
Bucks	110	101	106	96	92
Dorset	104	108	105	99	91
Hertford	98	115	101	91	101
Wiltshire	101	107	105	110	105

It should be emphasised that these figures are put forward to give an approximate view of the facts, and that no great weight attaches to any single index. As pointed out before, the county division in the case of the Foresters may not be quite the same as for the Manchester Unity. The few figures given above suggest that the relative distributions of the counties, according to the experiences of the two societies, are in fair agreement, and the numerical measure of this agreement is indicated by the fact that the correlation between corresponding figures in the two columns for the Foresters is $.78 \pm .040$, while when mean indices are formed from those two columns the correlation between these and the total pay sickness indices for the Manchester Unity is $.61 \pm .066$. On the whole, I am of the opinion that the figures for the Manchester Unity represent more closely the relative distribution of sickness of the general male adult population than do those for the Foresters, since for most counties they are based upon larger numbers and the boundaries approach nearer to the administrative counties of the same names. For this reason the Manchester Unity indices have been used in Map III to indicate graphically the variation in sickness-claim in the counties of England and Wales. The shading adopted is the same as that employed in Maps I and II and referred to in section 6, and relates to the "Total Pay" sickness index. But with very little alteration, the same map would represent the distribution of the "Full Pay" sickness index.

The most striking feature of the map and the table is the comparatively lowly position of Lancashire as regards sickness claim. When dealing with mortality in section 6, it was noted that all the data agreed in fixing Lancashire as the county of greatest mortality (correction having been made for age), the index being from 25 per

cent. to 30 per cent. in excess of that for the whole of England and Wales. Both the Foresters and the Manchester Unity, however, agree in placing the sickness-claim index for that county well below the index for the whole country (correction, again, having been made for age).⁷ As the sample of the Lancashire male adult population in the Foresters embraces about 15,000 persons, and that in the Manchester Unity no less than 60,000, the indices in the table can be taken as a very fair approximation of the relative position of the general adult male population of the county. The question is one of such interest that the valuations of other societies admitting geographical comparison have been investigated, and the relative position as regards the whole of the society of the sickness and mortality experience of the Lancashire sample has been worked out. This has also been done for the three counties of Durham, Northumberland and Glamorgan, which occupy prominent positions in the tables. The results can be summed up as follows:—

Manchester Unity.		Foresters.				Rehabites.				Shepherds.	
Sick-ness.	Mor-tality.	1902.		1907.		1900.		1905.		1900. Sick-ness.	1905. Sick-ness.
		Sick-ness.	Mor-tality.	Sick-ness.	Mor-tality.	Sick-ness.	Mor-tality.	Sick-ness.	Mor-tality.		
LANCASHIRE.											
95	123	93	138	97	127	99	110	87	112	80	90
DURHAM.											
126	107	111	113	106	113	107	83	123	95	135	141
NORTHUMBERLAND.											
115	109	153	108	134	106	94	80	124	89	107	113
GLAMORGAN.											
129	118	119	111	121	108	125	95	129	107	113	122

The statistics of the Rehabites and Shepherds give confirmation of those already put forward from the Manchester Unity and the Foresters. In Lancashire the sickness claims (when allowance has been made for age) are always below the general figure for the whole of the country, while the mortality is much higher. Of course, the incidence of sickness-claims is by no means homogeneous throughout the county, and particular districts can be picked out

⁷ The case of the West Riding of Yorkshire is similar, though not so pronounced, the mortality being about 10 per cent. above that of England and Wales (when age is allowed for), but the sickness, if anything, is below the general, the figures referring to about 60,000 members of the Manchester Unity.

where the sickness index is very high. Perhaps the most prominent of these is St. Helens, the sickness index for this being as high as 150 for the Manchester Unity (3,200 members), and 113 and 122 for the two valuations of the Shepherds. With far more comprehensive and reliable data likely to be forthcoming in the near future, it would be premature at this time to discuss the causes of the low rate of sickness-claim. It may be a partial outcome of the very heavy mortality from which Lancashire suffers at early ages, or it may be connected with the fact that the high wages received by textile workers and others in that county render it especially desirable to shorten the period of convalescence as much as possible.

The indices given for the four societies above for the sickness and mortality in Durham, Northumberland and Glamorgan support one another, on the whole, quite well. Durham and Glamorgan appear to be the counties with highest rates of sickness claim, which, since both contain a large proportion of miners, is in accordance with the figures given for occupational morbidity in section 11 and 15. The experience of the Foresters in Northumberland is much worse than that of any of the other societies, and this may be caused by the inclusion of a greater proportion of miners. A further noticeable point in the table is the position occupied by a number of the southern counties—Buckingham, Dorset, Hertford and Wiltshire—which, considered from the point of view of mortality, are usually looked upon as healthy districts, but which for the Manchester Unity population show total sickness indices of 106, 105, 101 and 105 respectively against mortality indices of 89, 86, 79 and 84. This is not due, as might, perhaps, be suggested, to a large proportion of aged members being disabled and receiving reduced pay, for the corresponding indices for "Full Pay" sickness are 110, 104, 98 and 101, all very much higher than the indices showing the relative positions as regards mortality among those counties.

On the whole the survey of the statistics of sickness claims which are available leads to the conclusion that their relative distribution throughout the counties is quite dissimilar to the relative distribution of mortality. The data, of course, are not sufficient to dogmatize upon, but there is such a general—though rough—agreement between comparable material that we appear to be justified in concluding that high mortality is not associated, in general, with excessive sickness.⁸

⁸ The absence of association between sickness and mortality was pointed out as long ago as 1816 by Mr. F. G. P. Neison. ". . . many fatal diseases . . . do not to any great extent incapacitate from labour, and in these "diseases the mortality may be high, while the amount of sickness is small."—*Contributions to Vital Statistics*, 2nd Edn., p. 108.

21. The effect of occupation on the total amount of sickness can be briefly regarded in the same manner as in sections 11 and 15. The number of weeks of sickness per member exposed in each of the three main age-groups for the four grades of occupation is shown in Table XXI.

TABLE XXI.—*Number of weeks of sickness per member exposed in occupation groups, Manchester Unity, 1893-97.*

Age-group.	Occupation group.				
	A, H, J.	B, C, D.	E, F.	G.	All.
—40.....	·93	1·13	1·38	1·75	1·03
40—60.....	2·20	2·68	2·92	3·94	2·38
60—.....	11·57	12·70	14·30	16·04	11·94
All	2·25	2·51	2·65	3·07	2·34

The increase in sickness in passing from the left of the table to the right is pronounced and persists in each age-group. Except in Group G—miners—it is caused almost entirely by the increase in the number of members making sick claims, and hardly at all by changes in the average duration of sickness. The table may be considered in the light of the facts brought out in the last section. It has already been stated that the higher sickness claims made by miners probably accounted for much of the high figure noticed in Durham, Northumberland and Glamorgan. The textile and woollen industries of Lancashire and the West Riding of Yorkshire are included in Group J, which helps to account for the moderate rates noticed there. Agriculture is included in the group with the lowest incidence of sickness, but, as pointed out in the last section, some of the agricultural counties of the south of England have sickness indices above that prevailing for the whole country.

Mr. Watson, from his wide experience, has expressed elsewhere the opinion that “it cannot, I think, be questioned that the rate “of sickness experienced in agricultural communities is lower “than the general average rate”—though in his survey of the Manchester Unity experience of 1893-97 he found so little difference between A and H-J (see section 11) that no advantage could be gained by treating them separately. These three contained about 13 per cent., 31 per cent., and 33 per cent. respectively of the exposed to risk in the whole Society. His investigation will bear the conclusion that while agriculture is below the general average as regards sickness rate it is not nearly to the same extent as it is below the general average as regards mortality rate.

22. The presentation of the facts of the subject will be completed in this section by tracing the changes which have occurred in the amount of sickness claim per member exposed over a series of years. As in the case of mortality touched upon in section 7, most societies give information which can be arranged under this head. A selection only, however, can be made and that of the Hearts of Oak—which admits of systematic statistical classification—will be dealt with.

Since change in age will, of course, affect the figures the age-group 30–34, for which I have information back to 1883, will alone be considered. The total amount of sickness per member in this age-group over a series of years for each of the three divisions is shown in Table XXII.

TABLE XXII.—*Number of weeks of sickness (full pay) per member in age-group 30–34, Hearts of Oak, 1883–1910.*

Year.	Metro-politan.	Large towns.	Country districts.	All.	Year.	Metro-politan.	Large towns.	Country districts.	All.
1883....	'82	1 '09	'94	'89	1897	'78	1 '17	1 '03	'97
'84....	'83	1 '03	'97	'91	'99	'96	1 '19	'89	'99
'85....	'82	1 '00	'98	'89					
'86....	'84	1 '01	1 '02	'92	1900	'92	1 '14	'92	'99
'87....	'79	1 '02	'89	'85	'01	'88	1 '18	'89	'96
'88....	'79	'94	'92	'86	'02	'90	1 '15	'86	'95
'89....	'74	'95	'83	'82	'03	'85	1 '17	'90	'95
					'04	'86	1 '18	'90	'96
1890....	'90	1 '16	1 '05	1 '02	'05	'79	1 '05	1 '04	'96
'91....	'90	1 '09	1 '00	'98	'06	'82	1 '09	'97	'95
'92....	'93	1 '11	1 '19	1 '07	'07	'86	1 '11	1 '02	'99
'93....	'95	1 '16	1 '18	1 '09	'08	'89	1 '13	1 '06	1 '03
'94....	'77	1 '04	1 '04	'94	'09	'90	1 '12	1 '02	1 '01
'95....	1 '00	1 '10	1 '20	1 '10					
'96....	'77	'91	1 '14	'93	1910	'79	1 '00	'95	'92

These figures are diagrammatically represented in Fig. 5 together with the corresponding percentages of members making sick-claims, and the average duration of the claims. The movements from year to year are very much the same as for the latter, and this indicates that alteration in the number of weeks of sickness-claim per member from year to year is due much more to the variations in the number of members sick than in the average duration of the claim. There was a very marked rise in the sickness in 1890 due to an epidemic which appears to have attacked each division equally. This epidemic visited the Manchester Unity severely, and reference is made to it in the 7th Valuation of that Order, but no statistics are given of it. It is interesting to note, that, following the epidemic of 1890–91 the sickness-claims were distinctly high in the following three or four years—with the exception

of 1894—in each division, but dropped considerably in the Metropolis and Large towns in 1896.

To illustrate in more detail the change which has occurred in the sickness experience of the Hearts of Oak during the present century Table XXIII has been constructed. This shows the sickness rates for each age-group in the quinquennia 1901-05 and 1906-10, and the change per cent. of the latter over the former.

TABLE XXIII.—*Change in total sickness rates in Hearts of Oak, 1901-05 and 1906-10.*

Age-group.	Metropolitan.			Large towns.		
	1901-05.	1906-10.	Change per cent.	1901-05.	1906-10.	Change per cent.
20—24....	·67	·81	+ 21	·92	1·03	+ 12
—29....	·79	·86	+ 9	1·10	1·09	— 1
—34....	·96	·97	+ 1	1·31	1·27	— 3
—39....	1·14	1·17	+ 3	1·48	1·42	— 4
—44....	1·32	1·44	+ 9	1·63	1·65	+ 1
—49....	1·80	1·79	— 1	1·93	1·98	+ 3
—54....	2·68	2·75	+ 3	2·59	2·77	+ 7
—59....	3·95	4·34	+10	4·49	4·22	— 6
—64....	7·07	8·70	+23	8·41	9·53	+13
—69....	12·6	14·9	+18	14·6	16·3	+12
—74....	21·4	23·9	+12	27·8	25·2	—10
—79....	30·1	35·4	+18	33·3	32·1	— 4

Age-group.	Country districts.			All.		
	1901-05.	1906-10.	Change per cent.	1901-05.	1906-10.	Change per cent.
20—24....	·84	·91	+ 9	·80	·92	+15
—29....	·94	1·04	+11	·93	1·00	+ 7
—34....	1·09	1·20	+10	1·11	1·15	+ 4
—39....	1·24	1·38	+11	1·27	1·33	+ 5
—44....	1·54	1·69	+10	1·48	1·60	+ 8
—49....	1·64	2·02	+23	1·78	1·92	+ 8
—54....	2·12	2·50	+18	2·51	2·67	+ 6
—59....	3·48	3·72	+ 7	3·91	4·13	+ 6
—64....	6·59	7·47	+13	7·16	8·50	+19
—69....	11·8	13·6	+15	12·8	14·7	+15
—74....	20·4	23·2	+14	22·2	24·0	+11
—79....	33·5	31·8	— 5	31·4	32·7	+ 4

The figures in this Table are particularly enlightening. They show that the change has not occurred uniformly throughout the country nor at all age-groups. In the Metropolitan district and the Large towns little, if any, change is discernible in the later half of the first decade of the century over the earlier so far as regards the ages between 30 and 50, but, in the Country districts, the

alteration has been much more marked. Remembering the imperfections of the data, it is hardly advisable to hazard any conjectures on the possible causes of this distinct difference between the Country districts and the rest of the Society. The figures may not represent any physical change at all, but, at any rate, they show that the increase in the amount of sickness benefit claimed in the Country districts is considerable in middle life.

23. The rest of the paper will be given over to the discussion of two or three problems suggested by the facts previously described.

The first of these problems has already been touched upon when discussing the geographical distribution of sickness in the counties of England and Wales and comparing it with that of mortality. This is to investigate the magnitude of the association which exists between the total extent of sickness claim and the number of deaths in the same population within a district. A positive association between these might by some appear to be axiomatic, though so long ago as 1885 Dr. Ogle pointed out that "a vast number of children of permanently "unsound constitutions, who under former conditions would have "perished in youth are now saved from early death by sanitary "interference," and "these grow up to adult life and diminish the "average healthiness of the adult classes, and so add to their death- "rates."

To demonstrate the existence or non-existence of this association we require data from a number of districts concerning *random* samples of the population drawn from them. The material collected by Friendly Societies affords the only possible data for such a problem, but the published valuations of most societies fail to give detailed information for individual districts, the only exceptions which could be found being the Rechabites, and, in less detail, the Manchester Unity. The last two valuations of the Rechabites and the last of the Manchester Unity afford material to work at.

At the time of the latest valuation (as at December 31, 1905) the Rechabites was divided into nearly 100 "districts," each containing a number of "tents," the "districts" varying considerably in number of members. On p. 61 of the Report of the valuation are shown the number of deaths occurring among members in each of the "districts" during the five years 1901-05, while in the following pages are given the comparative figures of "weeks of illness," dividing the latter up into "first twenty-six weeks," "second "twenty-six weeks" and "remainder of sickness." The corresponding "expected" amounts of sickness and "expected" mortality for each "district" are given, the standard taken being Neison's valuation of the *whole* of the Society for the ten years 1878-87. It is important to note that in working out these "expected" figures,

variations in age distribution only are allowed for, so that as regards all the other causes which affect amount of sickness and mortality, each "district" is looked upon as a *random* sample of the general society. In each district, therefore, the number of years exposed to risk at each age had to be known, due regard being paid to the time of entry of new members and withdrawal of seceders. This information is not given in the valuation, but only the number of members on the last day of the quinquennium. From a statistical point of view this is a great imperfection. It must also be remembered that practically all of the members who came within the "second twenty-six weeks" and "remainder of sickness" periods must have had the full benefit of the "first twenty-six weeks." (A few members would be receiving benefits under one or other of the former heads at the beginning of the quinquennium, and therefore would have passed through the "first twenty-six weeks" stage in the *previous* five-year period.) Thus the total number of weeks of sickness under the latter head cannot all be attributed to true short period sickness. In section 8 it was shown from Neison's report that roughly four-fifths of the total weeks of sickness "under twenty-six weeks" can be attributed to "short period" illnesses, while about one-third of the weeks of illness of a protracted nature fall within the first six months.

The information given in the report of the previous valuation is similar to that referred to above, but refers to the five-year period ending December 31, 1900.

Variations in the amount of sickness or of mortality in different districts, and in populations with the same number of years of life exposed to risk (for shortness in the remainder of the section, the phrase "populations of the same size" or of "constant "size" will be used), will depend chiefly upon the age distributions of those populations. Other causes of variation will be due to differences of locality, occupation, habits, &c., while finally there will be a residuum due to random causes. If we correlate the number of weeks of sickness of, say, "under twenty-six weeks," with the number of deaths throughout many districts, and correct for a constant size of population, we shall discover what is the extent of the influence of variations in age, occupation, locality, &c., acting altogether on the association between illness "under twenty-six weeks," and mortality. Of these causes age is a very potent one, as is shown by the figures given in Tables V and XVII.

It is clear that "districts" with a large proportion of old members will suffer to a great extent from sickness of all types, and also have the heavier mortality, the total number of years exposed to risk being the same throughout. Thus we should expect to find

a positive correlation between the amounts of the various grades of sickness and between each of these and mortality for such districts solely from the fact that all of these variables are correlated with age distribution. To ascertain the magnitude of that correlation is undoubtedly of interest, but it is of more interest to find the corresponding degree of association in populations of the same age distribution. Variations in the amounts of sickness and of mortality would then be due only to occupation, locality, &c., and we should then be able to discover if the resultant effect of occupation, locality, habits, &c., is to increase both claims for sickness benefit and mortality together, or the reverse, and to measure the correlation between the variations produced by the sum total of these causes alone, but not by differences of age distribution. The problem is statistically possible if we can correct our correlation for "constant age distribution," and to suggest an answer to it is the chief object of this section. Does a population—*e.g.*, the members of a branch of a Friendly Society—which by reason of its peculiar occupation, locality, habits, &c., sustains heavy claims for sickness benefit, suffer, on the average, from a high rate of mortality from these same causes?

The chief part of the problem is to find an adequate measure of age distribution. The prospect of finding a factor which will represent the age distribution of a particular population *for all purposes* does not appear hopeful. We cannot say that the age distribution of a population is represented by a certain index, in the same way as the sex distribution is represented by the ratio of males to total persons. For the *purpose of mortality rates* the death-rate in a "standard population" is used by the Registrar-General, and by this means we know what the death-rate of a particular district would have been had the proportion of its population within each age-group been the same as for the whole of the country. Thus, if the death-rate for the whole of the country is 15 per 1,000 per annum, and "the death-rate in standard population" for a particular town is 18 per 1,000 per annum we know that the resultant effect of occupation, locality, habits, &c., in the latter is to increase the number of deaths by 3 per 1,000, the differences due to age having been completely allowed for. But this "death-rate in "standard population" does not lend itself satisfactorily to treatment by the method of correlation. Pearson, in a paper dealing with Maynard's problem of the correlation between the death-rates from diabetes and cancer, has used a modification of this method by dealing with the "corrective factor" necessary to convert the crude death-rate into the standard death-rate (*Journal of the Royal Statistical Society*, 1910, vol. lxxiii, p. 534), and a similar method could be

employed when dealing with the various types of sickness. The material necessary for calculating these corrective factors in the case of sickness, however, is not given in the data used for this paper, and I therefore suggest another method of attack.

As before stated, the only data given, other than the figures of sickness and mortality actually experienced, are the "expected" amount of sickness of each type and of mortality, and the number of members in each district at the close of the quinquennium considered. We must assume that the latter really represents on some scale the population exposed to risk. This is probably not so unsatisfactory as it appears, and unless it can be shown that the particular times within the quinquennium at which entries and withdrawals occur is correlated with the amount of sickness and mortality, no appreciable effect on the correlations found in this paper is likely to be caused by this approximation.

If two "districts" have the same "expected" number of weeks of sickness, say, "under twenty-six weeks," they may differ considerably in age distribution, for one may consist of fewer members but of older ages. Even if the "districts" have the same number of members and the same number of "expected" weeks of illness "under twenty-six weeks," the age distributions need not actually be the same, though there is much greater probability that the difference will not be large. Thus by making constant the number of members, and also the number of "expected" weeks of sickness of a particular type, we do not make the absolute age distribution exactly the same. But it is not essential that the *absolute* age distributions of the "districts" should be the same in order that the necessary correction may be made; it is sufficient that the *effective* age distributions for the given problem in hand should be the same. If two districts have the same number of members and the same number of "expected" weeks of sickness "under twenty-six weeks," there may be differences between the numbers in the various sub-groups of age which may effect the number of weeks of sickness of the other types; but if the inquiry in question concerns only sickness "under twenty-six weeks," we can say that the *effective* age distributions for the problem in hand are the same. To take a hypothetical example: two districts of the same size are divided into age-groups, as follows:—

	Under 20.	20—40.	40—50.	50—60.	Over 60.	Total.
District A.....	15	20	30	20	15	100
„ B.....	25	25	20	20	10	100

the rates of sickness (number of weeks per member per annum) being for "under twenty-six weeks,"

	Under 30.	30—40.	40—50.	50—60.	Over 60.	Total.
	1·0	1·1	1·3	1·4	2·5	—

and for "second twenty-six weeks,"

	·06	·10	·16	·30	1·20	—
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The numbers are so arranged that the total number of weeks of sickness "under twenty-six weeks" is the same for each district, viz., 141·5. The total number of weeks of sickness of "second twenty-six weeks," however, is 31·70 for District A and 25·20 for District B. Thus, by making constant the number of weeks of sickness of the former type, in addition to the total size, we do not absolutely make constant the actual age distribution and the number of weeks of sickness of the latter type. The *effective* age distributions, so far as concerns sickness "*under twenty-six weeks*," are, however, the same. It is claimed, then, that by making the number of "expected" weeks of sickness "under twenty-six weeks" constant, in addition to rendering constant the number of members throughout a series of "districts," the age distribution of those districts is the same for the purposes of sickness of that type, and that if variations occur in the number of weeks of sickness *actually experienced* by the districts, these variations are due to causes other than age differences, *e.g.*, occupation, locality, habits, &c. If, therefore, we want the correlation between amount of illness of one type and of another, or of illness of a particular type and mortality, for a constant age distribution, it is sufficient to correct for (1) constant size; (2) constant "expected" number of weeks of illness of the first type; (3) constant "expected" number of weeks of sickness of the second type, or of "expected" number of deaths. This method will enable us to suggest an answer to the question: Do the "districts" which from causes other than those produced by age have heavy claims for sickness benefit of a particular type, have also, on the average, a large mortality or heavy claims for sickness benefit of another type?

It may be pointed out here that the same method can be applied to the important problems concerning the correlation between death-rates from various causes. Thus, to take, for example, Maynard's case of the correlation between deaths from cancer and from diabetes. The "expected" number of deaths from cancer and from diabetes could be worked out for every district on the basis of the age distribution of the whole community, or, in fact, of any other

standard population. Then the association between cancer and diabetes would be tested by finding the correlation between the number of deaths from cancer and from diabetes for constant size of population and for constant "expected" number of deaths from each disease (see Pearson, *supra* sections 3 and 4).

While discussing the subject from this particular point of view, it may be suggested that a useful addition to the knowledge given by the "standard death-rate" published in the Registrar-General's supplements for each registration district would be to give the number of "expected" deaths in each age-group, based upon the experience of the whole country. These numbers can readily be used to ascertain the "standard death-rate," and their publication would enable us at once to see in what age-group the extra mortality of a district with a high "standard death-rate" existed. They were found *ab initio* for the purposes of section 6 of this paper in order to get the "expected" numbers of male deaths over 15 in registration counties. Had they been stated for the individual age-groups, simple addition would have given the figures required. But no simple arithmetical operation on the *rate* for individual age-groups will give the *rate* for a composite group containing them.

It has already been pointed out that the variate taken to represent the number of years of life exposed to risk, viz., the number of members on the last day of the quinquennium, is not quite satisfactory. The imperfections, from a statistical point of view, are not so large as they would be for purely actuarial purposes, and this for two reasons: (i) The fifty-six "districts" which had between 1,000 and 10,000 members at the latest valuation were dealt with, the mean number of members being 2,412 and standard deviation 1,766. The range is thus considerable, and little error is likely to arise from taking the number of members in a district as 1,500, when, determined from the true number of years exposed to risk, it should lie between, say, 1,480 and 1,520. (ii) As in most statistical problems, we can group our observations, and the working unit was taken to the nearest hundred.

The data given by the latest valuation were first dealt with, and for the fifty-six districts the following figures were tabulated:—

- x_0 = "Expected" number of deaths.
- x_1 = Actual number of deaths.
- x_2 = " " weeks of sickness of first twenty-six weeks.
- x_3 = "Expected" number of weeks of sickness of first twenty-six weeks.
- x_4 = Total members.
- x_5 = Actual number of weeks of sickness of second twenty-six weeks.
- x_6 = "Expected" number of weeks of sickness of second twenty-six weeks.
- x_7 = Actual number of weeks of "remainder of sickness."
- x_8 = "Expected" number of weeks of "remainder of sickness."

The mean values, standard deviations, and correlations obtained from the data of the latest valuation are given at the end of the paper.

The final partial correlations which are of interest are ${}_{034}r_{12}$, ${}_{046}r_{15}$, ${}_{346}r_{25}$, ${}_{048}r_{17}$, ${}_{438}r_{27}$, and ${}_{468}r_{57}$. A knowledge of many of the other correlations is also useful, and they are given below:—

$r_{12} = \cdot774$	$r_{15} = \cdot900$	$r_{25} = \cdot856$
$4r_{12} = \cdot182$	$4r_{15} = \cdot734$	$4r_{25} = \cdot434$
$0r_{12} = -\cdot256$	$0r_{15} = \cdot410$	$3r_{25} = \cdot127$
$3r_{12} = -\cdot299$	$6r_{15} = \cdot467$	$6r_{25} = \cdot463$
$03r_{12} = -\cdot280$	$06r_{15} = \cdot392$	$36r_{25} = \cdot365$
$034r_{12} = -\cdot156 \pm \cdot088$	$046r_{15} = \cdot459 \pm \cdot071$	$436r_{25} = \cdot386 \pm \cdot077$
$r_{17} = \cdot857$	$r_{27} = \cdot533$	$r_{57} = \cdot839$
$4r_{17} = \cdot865$	$4r_{27} = \cdot264$	$4r_{57} = \cdot875$
$0r_{17} = \cdot692$	$3r_{27} = -\cdot295$	$6r_{57} = \cdot455$
$8r_{17} = \cdot394$	$8r_{27} = \cdot137$	$8r_{57} = \cdot596$
$08r_{17} = \cdot583$	$38r_{27} = \cdot113$	$68r_{57} = \cdot775$
$048r_{17} = \cdot583 \pm \cdot059$	$438r_{27} = \cdot158 \pm \cdot088$	$468r_{57} = \cdot857 \pm \cdot024$

In each of the above sets the correlation for a constant x_4 alone shows the effect of correcting for size only, *e.g.*, we find that the effect of *all* causes—*age*, locality, occupation, &c.—in districts of the same size is to produce a positive association of $\cdot182$ between mortality and illness “under twenty-six weeks” (80 per cent. being true “short period” sickness). Making x_0 constant gives us the result of correcting for effective age distribution as it affects x_1 only, and making x_3 constant gives the result of correcting for effective age distribution as it affects x_2 only. Similarly when x_0 and x_3 are put constant together. The chief correlation in this first set is ${}_{034}r_{12}$ and indicates that the resultant effect of occupation, locality, habits, &c.—in fact, of all causes other than age and size—is to produce a *negative* association between the amount of “short period” sickness (using this term approximately) and of mortality. This is hardly significant when compared with its probable error, but before commenting upon this and the other correlations, the corresponding figures from the data of the earlier valuation will be given.

For obvious reasons it was hoped to have used the same 56 “districts” when dealing with the earlier valuation. This was not possible, and only 53 could be employed for most of the correlations. For the most interesting, however, 55 were available. Most of the “districts” appear to have been in a state of rapid growth in the period under review, and the general impression formed when working at the earlier material was that it was not so reliable as the later. The means, standard deviations and correlations given at the end of the paper refer to the 53 “districts”; the figures in brackets refer to 55. The figures for “expected” sickness and

"expected" mortality for this valuation were derived in the same way as previously described, the same standard experience being taken.

The partial correlations are also given below in the same form as before:—

$r_{12} = .821 (.813)$	$r_{15} = .893$	$r_{25} = .927$
$4r_{12} = .357 (.465)$	$4r_{15} = .688$	$4r_{25} = .775$
$0r_{12} = -.371 (-.335)$	$0r_{15} = .312$	$0r_{25} = .291$
$3r_{12} = +.262 (.406)$	$6r_{15} = .365$	$6r_{25} = .335$
$03r_{12} = +.137 (+.156)$	$06r_{15} = .409$	$36r_{25} = .555$
$031r_{12} = +.041 \pm .093 (.096 \pm .090)$	$046r_{15} = .310 \pm .081$	$436r_{25} = .524 \pm .067$
$r_{17} = .843$	$r_{27} = .631$	$r_{57} = .779$
$4r_{17} = .797$	$4r_{27} = .411$	$4r_{57} = .695$
$0r_{17} = .648$	$3r_{27} = .319$	$6r_{57} = .474$
$8r_{17} = -.113$	$8r_{27} = -.132$	$8r_{57} = -.077$
$68r_{17} = .074$	$38r_{27} = .305$	$68r_{57} = .355$
$048r_{17} = -.005 \pm .094$	$438r_{27} = .297 \pm .084$	$468r_{57} = .360 \pm .081$

The use of x_7 —the number of "remaining weeks of sickness" after the first twelve months—is not very satisfactory, and I do not think that much reliability is to be attached to the correlations involving it. For this reason it is not proposed to discuss the last three sets of partial correlations given above for the two valuations. The other sets show a satisfactory agreement between the results derived from the material given by the two distinct valuations. The figures in these *suggest*—but at present no more than suggest—that the following statements may ultimately be found to indicate the relationships holding between the amount of mortality and the extent of the claims for sickness benefit.

(i) The resultant effect of *age*, occupation, locality, &c., is to establish a small correlation (.2 to .4) between the amount of illness claims of short period (80 per cent. of illness "under twenty-six weeks," i.e., of x_2 , is true "short period" sickness) and amount of mortality in the series of over 50 "districts."

(ii) When the effect of *age* is allowed for, the resultant effect of the other influences—occupation, locality, habits, &c.—is to produce no correlation whatever (if anything, it is negative rather than positive) between the amount of "short period" sickness claim and the mortality in the "districts."

(iii) The effect of *age* plus other causes is to establish a moderately large (.7) correlation between the number of deaths and the amount of sickness of the "second twenty-six weeks" in the "districts."

(iv) When *age* is corrected for there is still a significant association (.4) between the amount of this type of sickness and of mortality.

(v) The correlation between the amount of sickness of "first twenty-six weeks" and that of "second twenty-six weeks," when

the variations among the "districts" are produced by all causes other than by differences of size, is moderate ($\cdot4$ – $\cdot8$), and when this is corrected for age it is reduced but slightly ($\cdot45$).

These are the chief inferences which, I think, can be drawn from the material so far examined, but I would repeat that until further data are investigated these conclusions must be regarded very tentatively and as indications of what to seek for rather than statements to verify when better material is available.

The data provided by the latest valuation of the Manchester Unity would enable a similar investigation to be carried out on the relation between sickness and mortality throughout a series of districts. It could not be exactly comparable, however, since number of weeks of sickness is not given for the Manchester Unity, but only sickness cost, and this is divided into only two grades—Full Pay (*see* section 8) and Reduced Pay. A short investigation on approximate lines only has been carried out to ascertain the possible verification of the above suggested results. This has been attempted by correlating the mortality index (*see* section 6) with the corresponding sickness (Full Pay) index for various groups of the units into which the lodges of the Manchester Unity were collected. I think this is not so sound a process as dealing with actual numbers (not percentages) and forming partial correlations. The point can be tested to some extent by working out the correlation between similar indices in the case of the Rechabites and comparing with the corresponding partial correlations obtained when actual numbers and not percentages are employed. These correlations between indices to be compared with the values of $_{034}^{12}$ given above for the latest and the penultimate valuations of the Rechabites, viz.: $+ \cdot041 \pm \cdot093$ and $- \cdot156 \pm \cdot088$, are found to be $+ \cdot343 \pm \cdot080$ and $+ \cdot113 \pm \cdot090$ respectively.⁹ Thus there is evidence that the correlation between the indices is in excess on the positive side of the corresponding partial correlations by an appreciable amount, and the correlations shown below for the Manchester Unity are, therefore, likely to indicate an association in excess on the positive side of these which would be reached by the more laborious process of computing partial correlations similar to those worked out for the Rechabites.

⁹ In the hope of throwing further light on these correlations, the districts were divided into two groups according as they gave a positive or negative contribution to the general product moment for the later period. The former (30) gave a correlation of $+ \cdot782 \pm \cdot046$, and the latter (25) $- \cdot611 \pm \cdot084$. When the correlations for the same districts were worked out on the data of the earlier period they were found to be $+ \cdot412 \pm \cdot103$ and $+ \cdot227 \pm \cdot128$. Thus the districts with positive correlation in the second period also had positive correlation in the first period. This suggests further problems, which, however, cannot be discussed in this paper.

The object sought after in grouping the units in well-defined homogeneous geographical areas was to remove as far as possible one of the causes affecting sickness claims and mortality. The correlations shown below are independent of age effects and of geographical variations, and they indicate consequently the effect only of variations in occupation, habits, &c., on the extent of the association between sickness and mortality. They are therefore more restricted than are the correlations reached from the Rechabite material in which the effect of geographical variations could not be accounted for. The notation employed is:—

$$x_1 \equiv (\text{Full Pay}) \text{ sickness ratio.} \quad x_2 \equiv \text{mortality ratio.}$$

the statistical constants for the various groups of districts are:—

	\bar{x}_1	\bar{x}_2	σ_1	σ_2	r_{12}
North, South and West London and Stepney (54 units)*.....	95.9	74.4	12.3	13.9	-.119 ± .09
Lancashire (50 units)	96.6	93.1	19.6	13.0	-.094 ± .095
Yorkshire (62 units)	102.4	88.6	19.6	12.5	-.174 ± .085
Wales (38 units)	127.7	88.7	23.7	16.0	+ .141 ± .107
Dorset, Devon, Cornwall, Somers- et and Wilts (43 units).....	100.8	71.5	7.9	12.4	+ .130 ± .100
The rural parts of the counties of Lincoln, Bedford, Norfolk, Suffolk, Essex, Cambridge and Hertford (50 units).....	91.4	65.7	8.3	10.9	+ .215 ± .091

* When the correlation for this group is corrected for constant size, no difference whatever is made, the correlation between size and sickness and mortality indices being + .011 and - .016 respectively.

The first three groups are, for the most part, urban, and the last three rural. The first three correlations are negative and the last three positive, but not one of the whole six is in itself significant. The figures are rather tantalizing, and conclusions can hardly be drawn from them. They suggest that the true correlation for urban populations is negative, and for rural ones positive. Supposing the three urban groups are *independent* random samples from a population for which the true correlation is just positive, the chances are about 130 to 1 against the three negative correlations of the magnitudes shown occurring. But, as stated before, these correlations are likely to be in excess on the positive side of the corresponding partial correlations of the type that were worked out from the Rechabites' data, and the inference is that the effect of occupation, habits, &c., is to cause a negative correlation between the extent of sickness claims and mortality in the districts. The subject is worthy of fuller investigation, but all the evidence collected in this

paper tends to the conclusion that those causes (other than age) which produce high mortality in a district, do not, on the average, produce excessive (short period) sickness claims, and that there may be a small difference between urban and rural areas in this respect.

24. The second of the problems suggested by the facts set forth earlier in the paper is to determine what is the degree of permanence in the deviations from the "expected" (as determined from considerations of age alone) of the sickness claims and mortality actually experienced throughout a series of districts. This will be measured by the correlation between the sickness or mortality index in one period and in a consecutive one. The indices are determined by questions of locality, occupation, habits, &c., which for the members of a particular district of a friendly society change but little from one quinquennium to the next, so that some degree of permanence in the indices should be anticipated. Suitable data for this problem are not prepared for the Manchester Unity, but the two valuations of the Rechabites used above permit of an inquiry being made. Let—

y_a denote the index for sickness of "first twenty-six weeks" in the earlier period.

y_b denote the index for sickness of "first twenty-six weeks" in the later period.

y_c denote the index for mortality in the earlier period.

y_d denote the index for mortality in the later period.

Then r_{ab} and r_{cd} respectively will give the degree of permanence in the deviations from the "expected" of the sickness and mortality actually experienced. These have been worked out for the 47 "districts" which contained over 1,000 members at the close of both valuations. The correlation in the case of the mortality has also been worked out for the whole of the 55 "districts" dealt with earlier in the paper, and the results for these are given in brackets. The full statistical constants are:—

$\bar{y}_a = 102.553$	$\sigma_a = 15.866$	
$\bar{y}_b = 101.553$	$\sigma_b = 20.555$	$r_{ab} = .693 \pm .051$
$\bar{y}_c = 95.468 (93.600)$	$\sigma_c = 22.187 (23.047)$	
$\bar{y}_d = 85.511 (83.400)$	$\sigma_d = 21.939 (21.826)$	$r_{cd} = .661 \pm .055 (627 \pm .054)$

These figures indicate a fairly large correlation between the deviations from the "expected" in one quinquennium and the next, both for sickness and mortality. Possibly a more accurate measure of this degree of permanence would be reached by weighting each deviation according to the size of the population (roughly, the number of members) on which it is based. This has not been done, since the modification produced in the correlations dealt with in other similar problems in which weighting has been attempted has

always been small, and also because it is the unweighted correlations which are required for the regression equations. These regression equations are given below, the partial standard deviation being shown as well:—

$$\begin{aligned} y_b &= \cdot 898y_a + 9\cdot 25 & a\sigma_b &= \cdot 721\sigma_b \\ y_d &= \cdot 653y_c + 21\cdot 16 & c\sigma_d &= \cdot 750\sigma_d \\ (y_d &= \cdot 594y_c + 27\cdot 81) & (c\sigma_d &= \cdot 779\sigma_d) \end{aligned}$$

Thus the mean for all the 47 "districts" of the indices for sickness in the first period was 102·5 and in the second 101·5. Those districts which deviated by + 10 from the mean in the first period, deviated, *on the average*, by as much as 9·0 in the second. For the mortality the mean value changed considerably from the first to the second period, and a deviation of + 10 from the mean in the first period was followed, *on the average*, by one of 6·5 in the second.

The insight obtained through working at a similar problem previously (*Journal*, May and June, 1911) suggested that higher correlations might be found by grouping the "districts" in some way. The material was hardly sufficient to warrant the expenditure of much time on this object, and only two attempts were made. In the first of these the "districts" which were above the general mean index in the first period were taken together, and likewise those which were below that mean. This was a failure, the correlations reached being much smaller than those obtained when all were taken together.

The second attempt was to deal separately with those which were roughly northern "districts" and with those which were southern. The division aimed at no great geographical accuracy, the 23 "districts" which were more northern than the remaining 24 being taken together. The results were not altogether satisfactory, but are worth recording. The statistical constants for the two cases were:—

Sickness.

Northern districts.

$$\begin{aligned} \bar{y}_a &= 102\cdot 17 & \bar{y}_b &= 101\cdot 52 \\ \sigma_a &= 12\cdot 265 & \sigma_b &= 21\cdot 190 \\ r_{ab} &= \cdot 429 \pm \cdot 115 \\ \text{Regression line } y_b &= \cdot 742y_a + 25\cdot 67 \\ a\sigma_b &= \cdot 903\sigma_b \end{aligned}$$

Southern districts.

$$\begin{aligned} \bar{y}_a &= 102\cdot 87 & \bar{y}_b &= 101\cdot 17 \\ \sigma_a &= 18\cdot 787 & \sigma_b &= 19\cdot 926 \\ r_{ab} &= \cdot 800 \pm \cdot 030 \\ \text{Regression line } y_b &= \cdot 344y_a + 1\cdot 13 \\ a\sigma_b &= \cdot 329\sigma_b \end{aligned}$$

Mortality.

Northern districts.

$$\begin{aligned} \bar{y}_b &= 100\cdot 96 & \bar{y}_d &= 90\cdot 26 \\ \sigma_c &= 23\cdot 387 & \sigma_d &= 21\cdot 719 \\ r_{cd} &= \cdot 671 \pm \cdot 072 \\ \text{Regression line } y_d &= \cdot 623y_c + 27\cdot 0 \\ c\sigma_d &= \cdot 741\sigma_d \end{aligned}$$

Southern districts.

$$\begin{aligned} \bar{y}_c &= 85\cdot 92 & \bar{y}_d &= 77\cdot 71 \\ \sigma_c &= 20\cdot 167 & \sigma_d &= 20\cdot 313 \\ r_{cd} &= \cdot 560 \pm \cdot 095 \\ \text{Regression line } y_d &= \cdot 561y_c + 29\cdot 0 \\ c\sigma_d &= \cdot 828\sigma_d \end{aligned}$$

The only significant increase in the correlation is for sickness in the southern districts, for which it has now the quite high value of .89. In two of the other cases the association is actually less than that obtained when dealing with the "districts" as a whole.

An interesting feature of these constants when division is made into northern and southern districts is that while for sickness the mean indices are practically the same, for mortality the mean index for the northern is considerably higher than the corresponding value for the southern districts. Thus the statistics provided by the Rechabites support the conclusion before stated from Mr. Watson's investigation that the variation effected by locality is smaller in the case of sickness than for mortality.

The question of the permanence in the amount of sickness claims from year to year in individual localities can be dealt with, to some extent, by means of information contained in the annual reports of the Hearts of Oak. For each of the 38 towns composing the "Large towns" frequently referred to in the course of this paper is given, every year, the estimated number of members and the average number of weeks of sickness per member "well" or "ill." This information is not so satisfactory for the present purpose as is that given by the Rechabites, since it does not allow of account being taken of alteration in age distribution of the members. But this alteration from one year to the next must be small, and if the number of weeks of sickness claim per member changes, say, from 1.1 to 1.3, we may be fairly certain that little of the change has been caused by an increase in the general age of the members. What the Hearts of Oak data permit us to investigate, then, is the degree of permanence in the actual amount of sickness per member in districts, and not in the deviation from the "expected," and for this purpose the figures for 30 of the 38 Large towns (the remaining eight had fewer than 1,000 members, approximately) were made use of. As these are given on a uniform basis over a long series of years we need not restrict ourselves to the correlation between figures for consecutive years, but can also use those referring to years at wider intervals apart. We can thus ascertain if there is any diminution in correlation as the interval is increased, or if it follows any "period." No greater interval than six years has been employed, and the results are set out below. The numbers above the diagonal running from the left-hand top corner show the correlations, and those vertically downward on the left-hand side the means and standard deviations.

Means, standard deviations of and correlations between the number of weeks of sickness per member for various years. Hearts of Oak (30 towns).

Mean.	Standard deviation.	Year.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.
1.19	.227	1901	.786	.843	.800	.625	.661	.631	—	—	—
1.20	.210	'02	—	.878	.803	.505	.687	.676	.765	—	—
1.19	.222	'03	—	—	.900	.653	.860	.725	.856	.821	—
1.27	.208	'04	—	—	—	.784	.851	.737	.770	.734	.798
1.13	.182	'05	—	—	—	—	.758	.560	.666	.642	.627
1.23	.226	'06	—	—	—	—	—	.651	.802	.724	.753
1.26	.256	'07	—	—	—	—	—	—	.711	.678	.622
1.32	.207	'08	—	—	—	—	—	—	—	.891	.837
1.25	.210	'09	—	—	—	—	—	—	—	—	.770
1.16	.202	'10	—	—	—	—	—	—	—	—	—

The correlations can best be considered according to the interval between the years to which they refer, and can be summarised thus:—

Interval.

	One year.	Two years.	Three years.	Four years.	Five years.	Six years.
Mean Correlation.....	.792 (9)	.753 (8)	.702 (7)	.700 (6)	.711 (5)	.754 (4)

the figure in the bracket giving the number of correlations from which the mean is obtained. The correlation is as high as .8 between the amounts of sickness in successive years, falls to .7 when the interval has increased to three and four years and for the longer intervals appears to increase. The uniformity in the trend of these numbers would, if the differences were significant, be decidedly suggestive. To test the significance of the differences is a complicated matter, and as it would involve the determination of a number of other correlations not previously worked out the attempt to obtain the probable errors of the above means of correlations has been abandoned. From rough general considerations (probably of little value) I have formed the opinion that the difference between any two of the above means is not, *per se*, significant. The uniform tendency of the figures, however, introduces a further factor, and, on the whole, I think it must be conceded that no conclusive inferences can be drawn except that there is a fairly high degree of permanence persisting throughout many years in the amount of sickness claim per member exposed in individual towns.

25. The third of the problems to which reference has been made is the possibility of reaching a more reliable knowledge of the amount of sickness to be expected in individual areas than is given by the methods in general use. These consist, generally,

in knowing the age distributions of the local populations, and applying to each age-group the sickness rate experienced in some large standard population. The desideratum is to have the standard population as nearly alike in respect of occupation, situation, &c., the local population as possible. Frequently they are totally unlike, and the information for every one of the hundreds of courts and lodges is obtained from the experience of a previous period of the whole of the society to which they belong, and in certain cases of other societies. The two alternatives to this are (*a*) to use the experience of the locality itself for a previous period without reference to the age distribution, (*b*) to subdivide the whole society into a few main groups according to some well defined characteristic (as done, for example, in Mr. Watson's investigation of the Manchester Unity, 1893-97) and to use the experience of each group for the districts contained within it. With regard to (*a*) it has been shown that there is quite a large degree of permanence in the amount of sickness per member in spite of changes in age distribution, and if the object is to obtain beforehand a knowledge of the amount of sickness to be anticipated in a particular locality in a given period (which is not necessarily the actuaries' object when giving figures of "expected" sickness) the method will, as indicated below, in some cases give better results than are obtained by the more laborious process of finding the age distribution and applying the experience of some standard population, though this, of course, depends upon the particular standard population adopted. The method, however, is open to the objection that for small populations random fluctuations are likely to be proportionally large. (*b*) would give better results than are reached by having one standard population for the whole of a society, but would entail much more detailed "experiences" being worked out, and these would require a knowledge of the age distribution of local populations. Mr. Watson's "experience" of the Manchester Unity was arranged in groups for sickness, but according to occupations. Thus, if the details of these groups were used to ascertain the "expected" sickness for a locality not only would the age distribution of the members be required, but also the occupation-distribution, and the labour involved would be considerable.

I suggest the use of regression equations to be well worthy of the consideration of actuaries dealing with these subjects. The data are not available to test the use of these modern statistical implements completely, but from figures given below it will be seen that their use may save considerable labour, and at the same time bring the "expected" figures more close to those actually experienced in individual localities. Regression equations have not been employed in practice for estimation and prediction purposes to the extent which might have been anticipated. The labour and

pertinacity required to develop them in any particular problem to their best form is probably one of the causes of this, while their theoretical foundation is not always understood. But their practical utility of enabling us in a simple way to make use of the mean experience of the past for purposes of estimation at the present or the future is considerable. In the question of the estimation of local populations, for example, it is difficult to give adequate theoretical reasons why the use of regression equations based on births and deaths can be made to give better results than are reached on the assumption that the birth and marriage rates in a locality remain constant throughout an intercensal period, but the fact remains that the results are, when the variables and arrangement for the regression equations are properly chosen, very much better.¹⁰

It has already been stated that the Hearts of Oak annual reports show the number of weeks of sickness per member for each of the 38 towns composing the "Large towns." An attempt has been made to estimate for 1910 the figures for the 30 towns referred to in the last section by means of the figures given for the previous three years. Thus if x_1, x_2, x_3, x_4 and x_5 denote the number of weeks of sickness per member in 1906, 1907, 1908, 1909 and 1910, respectively, the following equations are found:—

$$x_4 = \cdot 904x_3 + \cdot 056 \quad (\text{i})$$

$$x_4 = \cdot 839x_3 + \cdot 075x_2 + \cdot 048 \quad (\text{ii})$$

$$x_4 = \cdot 834x_3 + \cdot 074x_2 + \cdot 007x_1 + \cdot 017 \quad (\text{iii})$$

the statistical constants on which they are based being given in the previous section.

The equation (ii) was the one used in order to predict the figures for 1910 from those in the previous years, *i.e.*, the relationship $x_5 = \cdot 839x_4 + \cdot 075x_3 + \cdot 048$ was assumed. Two other estimates were made (*a*) by assuming the figure for 1910 to be the same as for 1909, and (*b*) by assuming the 1910 figure to be given by the mean of those for 1908 and 1909. The number of weeks of sickness per member among the 30 towns in 1910 varied from $\cdot 85$ in Reading to $1\cdot 79$ in Doncaster, and the maximum errors by equation (ii), (*a*) and (*b*) were $\cdot 30, \cdot 34$ and $\cdot 35$, respectively. The distributions of errors arranged in groups are:—

	0— $\cdot 04$.	$\cdot 05$ — $\cdot 09$.	$\cdot 10$ — $\cdot 14$.	$\cdot 15$ — $\cdot 19$.	$\cdot 20$ — $\cdot 24$.	$\cdot 25$ — $\cdot 29$.	$\cdot 30$ — $\cdot 34$.	$\cdot 35$ — $\cdot 39$.
Equation (ii)	4	8	8	6	2	1	1	—
„ (<i>a</i>)	4	6	6	4	6	2	2	—
„ (<i>b</i>)	4	5	6	4	7	2	1	1

¹⁰ See *Journal of the Royal Statistical Society*, May and June, 1911. More recent work has considerably improved upon the arrangement of the equations used, and the results have been further improved.

The usual criterion taken as representing the general error—the square root of the mean of the squares of the individual errors—has the values $\cdot 140$, $\cdot 167$ and $\cdot 175$ for the three cases, respectively, these being calculated on the ungrouped errors. It is hardly necessary to express the errors as percentages of the actual figures, since the large errors occur, for the most part, by each method in the same towns. Thus it appears that the regression equation working upon rough data and with no grouping according to similar characteristics, gives appreciably smaller errors than are given by the other methods.

The next natural step would be to compare the errors above with those given by the “expected” figures determined by the actuaries’ usual method, *i.e.*, from a knowledge of the age-distribution of each town and the use of some standard experience. Unfortunately, however, this cannot be done. Even if the age-distribution of the members for each town were published, the labour of calculating the “expected” numbers would be very considerable. A substitute for this is possible from the material of the Rechabites, where the figures for two consecutive quinquennial periods are available as well as the “expected” numbers on the usual basis. From this material has been worked out the number of weeks of sickness (first twenty-six weeks) per member per annum for each of the 85 districts employed in section 23, and compared with (i) the number of “expected” weeks of sickness (first twenty-six weeks) on the basis of the standard experience, and with (ii) the number of weeks of sickness (first twenty-six weeks) per member for the previous quinquennium. In this manner the errors arising when using (i) and (ii) to indicate the amounts of sickness to be anticipated can be found, and their distributions are:—

	0—'01.		'05—'09.		'10—'11.		'15—'19.		'20—'21.		'25—'29.		'30—'31.		'35—'39.		'40—'44.		'45—'49.	
(i)	11	13	8	6					4	5			4		2		1		1	
(ii)	14	12	12	12					2	1			2		—		—		—	

These figures are not strictly comparable with similar ones for the Hearts of Oak above, since (*a*) they are spread over a complete period of ten years, during which the age-distribution may change quite appreciably. This would diminish the reliability of the estimates by (ii). (*b*) the number of members at the end of the period has been used and not the number of years of life exposed to risk in calculating the sickness per member. But this does not affect the comparison of the results by (i) with those by (ii). It is clear that (ii) gives more reliable estimates than (i), the root mean squares of the corresponding errors (ungrouped) being $\cdot 134$ and $\cdot 192$.

Thus the use of the "expected" figures (obtained by the usual method) for number of weeks of sickness, gives a knowledge of the amount of sickness to be anticipated in localities inferior to that acquired by assuming that the number of weeks of sickness per member remains the same over two successive periods. And this is in spite of the fact that the former quite reasonably gives the amount to be anticipated for the whole country (the "experienced" was 3 per cent. in excess of the "expected") and that it requires a knowledge of the age-distribution of each local population.

It thus appears that for the Hearts of Oak the regression equation would predict the amount of sickness to be anticipated to a closer approximation than would be reached by assuming the number of weeks of sickness per member constant over two successive periods, and that for the Rechabites the latter method gives better results than does the usual method which requires a knowledge of the age-distribution of each local population. I prefer to look upon the actuaries' terms "expected sickness" and "expected mortality" as analogous to the Registrar-General's "Death-rate in standard population." As pointed out before there would be certain advantages accruing from the publication of the "expected" number of deaths in each registration district, the corresponding thing to the "Death-rate in "standard population" being the index obtained by expressing the actual number of deaths as a percentage of the "expected" number. It is, I think, distinctly unfortunate that such a commonplace word as "expected" should be employed to denote what is in reality a highly technical term. The inverted commas are frequently overlooked or dropped altogether, and from platform, press and pulpit one could draw examples of the fallacies involved in its use by the non-statistically trained person. Yet the "Death-rate in "standard population" is never heard of in polemical discussions; the mere sound is sufficient to reserve it for those acquainted with its real meaning. The actuary rarely attempts to take any factor into account other than age when giving his "expected" figures. A closer "expectation," *taking all factors into account*, can, I believe, be reached in a much simpler and less laborious manner.

26. The last of the problems which it is proposed to refer to in this paper is one suggested by the geographical distribution of sickness, dealt with in section 19. It was there shown that the distributions of sickness (when correction is made for age) both for full pay and reduced pay are quite skew, and have a long tail at their upper ends. Assuming that each Manchester Unity "unit" (see section 5) is a random sample of the male adult population of the district from which it is drawn, an interesting inquiry will be to ascertain what effect is produced on the estimated amount of

total sickness when the skewness of the distributions and the variations in the relative sizes of the samples are taken into account. If, for example, the "units" at the upper end of the distribution represented a much smaller proportion of the adult male population in their districts than the "units" at the lower end, it would be rash to take the sickness experience of the whole society as that to be anticipated for the whole adult male population. This problem, then, can be stated thus: If the sickness of the whole of the Manchester Unity be represented by the index 100, what figure will represent the sickness of the total male adult population of the country when account is taken of the heterogeneity in the distribution of sickness and of the relative sizes of the Manchester Unity samples? The calculations are to serve no practical purpose, and the result will consequently be only a rough approximation. It is not practicable to deal with the "units" previously employed (section 5) and accordingly the county areas have been taken as the boundaries of the samples. The sickness index for "Full Pay" and the *modified* index for "Reduced Pay" are those used in section 20. (The modified index has been taken so that the index for the whole society is 100). The male population between the ages of 16 and 70 for each of the counties at the Census of 1901 has been aggregated from the Census reports, and each of these populations has been assumed to have the same sickness indices, both "Full Pay" and "Reduced Pay" as the corresponding Manchester Unity sample drawn from it.¹¹ The whole of the 1,345,000 adult males in Lancashire, for instance, are assumed to conform to the indices, 96·8 for "Full Pay" and 88·6 for "Reduced Pay," which are the figures for the Manchester Unity sample in Lancashire. When the indices for each county are weighted according to the *Manchester Unity* population the index for the whole society is, of course, 100 for both "Full Pay" and "Reduced Pay." When they are weighted according to the *Census* (1901) male populations between 16 and 70 the resultant indices are found to be 101·1 and 100·8 respectively. These results are a little surprising and indicate that though the proportion of the adult males who are members of the Manchester Unity varies from county to county, the society has not, on the whole, drawn its members from those of high rather than of low sickness. Three of the four counties (or collection of counties) with the highest sickness indices show a greater proportion of their population in the Manchester Unity than the corresponding proportion for the whole

¹¹ It is clear from the details in the Manchester Unity Valuation that the counties used are not coterminous with the geographical counties used in the Census. The Unity's Middlesex, for example, appears to contain parts of Essex. I think the effect caused by such facts as this, however, is not likely to be large.

country. These are North Wales (10.3 per cent.), Monmouth (9.0 per cent.), and Glamorgan (8.1 per cent.), the percentage for the whole of England and Wales being 7.5. On the other hand, Durham, which has the second highest sickness index among the counties, has only 4.8 per cent. of its adult male population in the Manchester Unity, and Lancashire's 61,300 members represented only about 4.6 per cent. of its adult males between 16 and 70.¹²

A similar process has been carried out in the data given by the last two valuations of the Foresters, where the figures are given for total sickness only. The indices for the whole male adult population, when account is taken of the individual county indices in conjunction with the proportion of the population in each county, were found to be 99.5 and 99.8 for the 1902 and 1907 valuations respectively. This agrees roughly with the Manchester Unity result, and is accounted for, to a large extent, by the fact that a number of the largest counties—Lancashire, West Riding of Yorkshire, &c.—have indices not far from 100. The few with large deviations above 100 are balanced by a larger number of counties with moderate deviations below.

It may be remembered that in the first report of the actuaries concerning the National Insurance Scheme, rates were worked out for each age-group of the whole of the estimated number of insured males, when account was taken of the relative numbers of insured in the four occupation grades described early in this paper, and the individual rates found by Mr. Watson for each of these groups. The rates so deduced for each period of sickness were about 10 per cent. above the general Manchester Unity standard for nearly all groups (showing that the society is not a random sample drawn from all occupations), this including claims due to accident which are now met under the Workmen's Compensation Act.

27. A few words may, perhaps, be said at this point upon a subject which has received some attention since the introduction of the National Insurance Bill, viz., whether or not the incidence of sickness among the population which did not previously belong to the friendly societies is higher than that of the old friendly society population. The argument has been advanced, and, indeed, in some quarters it has been put forward as axiomatic, that as the old societies dealt for the most part with selected lives, those who were outside necessarily had higher sickness rates than those within. The statistical evidence for this view is hardly commensurate with the vigour by which it has, by some, been maintained. What the statistical evidence does show is that the *mortality* of those outside the societies was greater

¹² These percentages are only approximate, since the population figures are from the Census of 1901, but the Manchester Unity's are more recent.

than that within. A comparison of the death-rates given in Table V deduced from the English Life Table No. VI (that adopted for the actuarial purposes of the national scheme) with those of the Manchester Unity demonstrates this. The figures shown in that table, in fact, understate the real difference between the two classes, since the Life Table includes the experience of the professional and commercial classes, &c., which is much below that of the whole community. But the balance of the evidence put forth in this paper is to the effect that populations with high mortality do not suffer from excessive claims for sickness benefit. Lancashire and the West Riding of Yorkshire are salient cases in point, and although Durham and Glamorgan appear to point in the opposite direction, it must be remembered that in those counties many of the excessive sickness claims are due to accident. On the other hand, some of the southern counties with very low mortality rates show sickness rates not below the general average for the country. The facts brought out in this paper intimate that heavy sickness claims and high mortality are rarely associated and then only in counties where the sickness claims are more than usually swelled by the inclusion of much that is due to accident and which is now dealt with under the Workmen's Compensation Act.

On the whole, the review of the facts brought out in this paper suggests that the sickness experience of the newcomers to the societies through the National scheme is not likely greatly to exceed that of the members previously in those societies, and that the Manchester Unity tables (1893-97) will be, under adequate supervision, as applicable to the former as the latter. I believe, however, that the English Life Table (1891-1901) will over-state the mortality of the insured in future years, and that as this will lead to a larger proportion of survivors to the heavy sickness years between 60 and 70, more apprehension is to be felt on this head.

Before concluding this paper, a little may be said concerning the application of the method of correlation to the sickness data of Friendly Societies. No doubt this will be criticised on account of the imperfections of the material used. These have been pointed out in the paper, and the weight of them is fully appreciated by the writer. To some critics, the fact that there was a single imperfection would be sufficient reason to aver that the method is entirely inapplicable. Yet, with all the deficiencies of the data, I believe they are sufficiently good for more thorough analysis than has yet been given to them, and, in any case, their real value can only be assessed through working on them. It should be remembered that the correlation coefficient is essentially based upon the principle of averages, and in this connection a quotation from

a prominent actuary (Mr. G. F. Hardy) is particularly apt: "Whenever a group of persons or of societies is sufficiently homogeneous, the principle of averages will be found to apply as much in respect of sickness as for deaths." In applying a simple form of average—*e.g.*, in finding the average duration of sickness throughout the country—it is appreciated that the imperfections tend to neutralise one another, and precisely the same thing can be claimed when the average employed is the rather more complicated one of the correlation coefficient. So far as I am aware, the correlation coefficient has not before been employed on the sickness data of Friendly Societies, and no defence is needed for indicating the class of problems to which it can be applied. To the sceptical, I would point out the utilitarian results which have been achieved by the method, and the promise held out of further such results (section 25).

Finally, I must express my indebtedness to the following gentlemen, without whose assistance I should have had access to very little of the material here dealt with: Mr. W. Collins, of the Manchester Unity; Mr. W. Stead, of the Foresters; Mr. C. W. Burnes and Mr. C. Davis, of the Hearts of Oak; Mr. George Marshall, of the Rechabites; Mr. J. Duncan, of the Rational Association; and Mr. R. Kennedy, of the Shepherds. Above all, I have to express my thanks to Mr. A. W. Watson, since before invoking his aid I was able to make use of the data of but one society only.

APPENDIX.

(1.) *Statistical constants of curves in Fig. I.*

1892.

1910.

$$\mu_2 = 3.7428, \mu_3 = 5.1647, \mu_4 = 45.8270.$$

$$\mu_2 = 5.4666, \mu_3 = 8.7587, \mu_4 = 89.3617.$$

$$\beta_1 = .5696, \beta_2 = 3.2713.$$

$$\beta_1 = .4698, \beta_2 = 2.9912.$$

$$\text{Mean} = 35.70.$$

$$\text{Mean} = 40.68.$$

$$\text{Mode (and origin)} = 29.89.$$

$$\text{Mode (and origin)} = 33.04.$$

$$\text{Skewness} = .6007.$$

$$\text{Skewness} = .6545.$$

$$y = 21.36 \left(1 + \frac{x}{2.1196} \right)^{.9935} \left(1 - \frac{x}{12.2968} \right)^{5.7636}$$

$$y = 17.34 \left(1 + \frac{x}{2.2966} \right)^{.7028} \left(1 - \frac{x}{12.0873} \right)^{3.6911}$$

(2.) *Statistical constants of the distributions in Tables VIII and IX.*

TABLE VIII.

$$\mu_2 = 10.6789, \mu_3 = 6.9915, \mu_4 = 338.8677.$$

$$\beta_1 = .0401 \pm .02, \beta_2 = 2.9715 \pm .15.$$

$$\text{Mean, mode, and origin at } 79.29.$$

$$y = 68.95. e^{-\frac{x^2}{21.3578}}$$

TABLE IX.

$$\mu_2 = 16.7075, \mu_3 = 15.3855, \mu_4 = 817.3703$$

$$\beta_1 = .0508 \pm .02, \beta_2 = 2.9282 \pm .14.$$

$$\text{Mean, mode, and origin at } 95.28.$$

$$y = 58.66. e^{-\frac{x^2}{33.4150}}$$

(3.) *Statistical constants of the distributions in Tables XIX and XX.*

TABLE XIX.

$$\mu_2 = 11.8863, \mu_3 = 63.1759, \mu_4 = 1033.9047.$$

$$\beta_1 = 2.3766, \beta_2 = 7.3179.$$

$$\text{Mean} = 101.60.$$

$$\text{Mode} = 91.32.$$

$$\text{Origin} = \text{Mean} - 153.64.$$

$$\text{Skewness} = .5967.$$

$$y = 30.0606(x - 125.2080)^{2.5664} x^{-20.2696}$$

TABLE XX.

$$\mu_2 = 18.4470, \mu_3 = 34.5158, \mu_4 = 1263.1527$$

$$\beta_1 = .1898, \beta_2 = 3.7120.$$

$$\text{Mean} = 155.62.$$

$$\text{Mode} = 148.16.$$

$$\text{Origin} = 82.14.$$

$$\text{Skewness} = .1736.$$

$$y = 11.425 \left(1 + \frac{x^2}{254.224} \right)^{-9.8540}$$

$$e = 8.1605 \tan^{-1} \frac{x}{15.9444}$$

(4.) *Statistical constants for partial correlations given in Section 23.*(a.) *Latest valuation.*

$\bar{x}_0 = 79.43$	$\sigma_0 = 51.56$
$\bar{x}_1 = 67.59$	$\sigma_1 = 49.68$
$\bar{x}_2 = 11225.0$	$\sigma_2 = 9165.2$
$\bar{x}_3 = 10604.3$	$\sigma_3 = 7048.5$
$\bar{x}_4 = 2412.5$	$\sigma_4 = 1766.1$
$\bar{x}_5 = 1610.7$	$\sigma_5 = 1370.5$
$\bar{x}_6 = 1350.0$	$\sigma_6 = 883.8$
$\bar{x}_7 = 3457.1$	$\sigma_7 = 2951.0$
$\bar{x}_8 = 2764.3$	$\sigma_8 = 2171.6$
$r_{01} = .9296$	$r_{26} = .8362$
$r_{02} = .8807$	$r_{27} = .5328$
$r_{03} = .9300$	$r_{28} = .5422$
$r_{04} = .8779$	$r_{29} = .9803$
$r_{05} = .8995$	$r_{30} = .8718$
$r_{06} = .9606$	$r_{31} = .9183$
$r_{07} = .7368$	$r_{32} = .6195$
$r_{08} = .8288$	$r_{33} = .6579$
$r_{12} = .7740$	$r_{34} = .8188$
$r_{13} = .8494$	$r_{46} = .8442$
$r_{14} = .7711$	$r_{47} = .4893$
$r_{15} = .8997$	$r_{48} = .5312$
$r_{16} = .9310$	$r_{56} = .8777$
$r_{17} = .8674$	$r_{57} = .8287$
$r_{18} = .8661$	$r_{58} = .7349$
$r_{23} = .9620$	$r_{67} = .8098$
$r_{24} = .9639$	$r_{68} = .8950$
$r_{25} = .8556$	$r_{78} = .8833$

(b.) *Earlier valuation.*

$\bar{x}_0 = 51.79$	(52.96)	$\sigma_0 = 32.17$	(32.50)
$\bar{x}_1 = 50.70$	(51.38)	$\sigma_1 = 37.16$	(36.66)
$\bar{x}_2 = 8288.7$	(8523.6)	$\sigma_2 = 6059.9$	(6115.2)
$\bar{x}_3 = 7911.3$	(8296.0)	$\sigma_3 = 5206.6$	(5544.5)
$\bar{x}_4 = 1856.7$	(1952.7)	$\sigma_4 = 1178.8$	(1272.9)
$\bar{x}_5 = 1132.1$		$\sigma_5 = 1033.2$	
$\bar{x}_6 = 758.5$		$\sigma_6 = 538.6$	
$\bar{x}_7 = 2320.8$		$\sigma_7 = 2554.9$	
$\bar{x}_8 = 1749.1$		$\sigma_8 = 1663.3$	
$r_{01} = .9351$	$(.9210)$	$r_{13} = .8066$	$(.7722)$
$r_{02} = .9296$	$(.9334)$	$r_{14} = .7926$	$(.7533)$
$r_{03} = .9353$	$(.9290)$	$r_{15} = .8928$	
$r_{04} = .9333$	$(.9186)$	$r_{16} = .8871$	
$r_{05} = .9044$		$r_{17} = .8426$	
$r_{06} = .9494$		$r_{18} = .8869$	
$r_{07} = .7346$		$r_{23} = .9749$	$(.9645)$
$r_{08} = .7916$		$r_{24} = .9494$	$(.9349)$
$r_{12} = .8209$	$(.8128)$	$r_{25} = .9274$	
$r_{26} = .9441$		$r_{46} = .9145$	
$r_{27} = .6313$		$r_{47} = .5515$	
$r_{28} = .6801$		$r_{48} = .6221$	
$r_{34} = .9823$	$(.9809)$	$r_{56} = .9436$	
$r_{35} = .8789$		$r_{57} = .7791$	
$r_{36} = .9316$		$r_{58} = .8190$	
$r_{37} = .5886$		$r_{67} = .7084$	
$r_{38} = .6565$		$r_{68} = .7846$	
$r_{45} = .8363$		$r_{78} = .9654$	

DISCUSSION *on* DR. SNOW'S PAPER.

SIR EDWARD BRABROOK, in proposing the vote of thanks to Dr. Snow, said it was a satisfaction to him to hear a Paper read before the Royal Statistical Society on the subject of the experience of friendly societies. The Paper was a timely one, because, as it happened, the Council of the Society had recently appointed a Committee to consider the questions of mortality and morbidity, and undoubtedly the Paper would be of value to that Committee. It was evidently the result of a great amount of personal labour. It threw light on many interesting problems—such as the deaths in different districts, the diminution of mortality in recent years, and the value of selection—all of which were important practical questions. But he supposed that the main interest of the Paper related to the subject of sickness. Sickness benefit in friendly societies was a question of extreme difficulty. It was complicated by a variety of what he might call personal equations; it was varied by the occupation, the character, the climate, and by the surroundings generally of the persons who were under observation. He thought it was really hardly possible to construct a coherent definition of what sickness in friendly societies really was. It was not in any sense a definite physical fact; therefore, one had to deal with a variety of considerations, and he thought that the analysis with which Dr. Snow had favoured them would undoubtedly be extremely useful. The popular interest in the Paper was probably greatest in regard to those passages which related to the National Insurance Act. He did not think at that hour of the evening he ought to prolong the discussion by any detailed observations in regard to that part of the Paper, but he was sure that in its permanent form in the *Journal* it would be found to be exceedingly interesting.

MR. A. W. WATSON, in seconding the vote of thanks, said he had to express his entire agreement with Sir Edward Brabrook as to the difficulty in defining the "sickness" with which the friendly societies had to deal. But the friendly societies found less difficulty in dealing with it in a practical manner, and in the great majority of friendly societies sickness was accepted as being a state of incapacity medically certified as preventing a member from following any remunerative occupation. The medical certificate was supposed to be the great safeguard of the society against malingering, but it was interesting to note that in some parts of the country where it was not the practice of the societies to employ medical officers and where medical certificates were not required, the sickness rate was comparatively low, and in these cases he thought it might be taken that the friendly societies themselves exercised responsibility which in other cases had been cast upon the doctor. That was a very admirable feature in the work of these societies, and it was a matter of regret that societies generally were ready to cast the entire responsibility upon the doctor, rather than satisfy themselves that the member was not only sick in a medical sense, but was suffering from the sort of incapacity for the relief of which their funds had

been accumulated. The "rate of sickness" with which actuaries had to deal in connection with the financial arrangements of friendly societies was sometimes very difficult to measure. It depended in any particular case, as Dr. Snow's investigation must convince them, very largely upon the occupational distribution of the membership. It might be said that in relation to the Manchester Unity whole society experience groups A, H and J, that was the agricultural and the general occupations involving no material risk, what one would call normal occupations, would bring about 92 per cent. of the general standard rate. Groups B, C, and D, representing the railway workers, outdoor labourers of all kinds, building trades and so forth, brought about 112 per cent. of the standard. The iron workers and steel workers brought about 140 per cent., and miners about 170 per cent. It was obvious that the proportions in which these varying degrees of risk, and many other degrees of risk, were mixed up in the general body would very considerably affect the total quantity of sickness properly to be expected in any particular case. The Hearts of Oak afforded a case in point. The valuations of that society were made upon the Manchester Unity standard. A certain degree of dissimilarity between the actual and the expected sickness was disclosed, and he had set himself to analyse the cause. Of course in such a case as the Hearts of Oak, it was quite impossible to dissect the entire experience of the society; but he considered that samples were admissible, and he took the occupations recorded at the date of entry of 1,000 members who had joined in a particular period 30 years ago, and another 1,000 who had joined a few years after that, and repeated the process with 4,000 separate members. He had found that the distribution had this effect. The Hearts of Oak excluded miners from its membership, but it had some miners in its ranks, because men had changed their occupations and had been allowed to remain in the Society; but it did not admit mining members, so he had no numbers in group G. On the other hand, the Hearts of Oak benefit was 18s. a week, and the rules of the society required, or did require, that a person should not be eligible for membership unless he were earning 24s. a week. The effect of that was to exclude the agricultural labourer. There was thus an elimination of risks at both ends, the lightest and the heaviest, and in the net result he found that the rate of sickness which he might expect according to occupational distribution of the society was almost exactly the same as the Manchester Unity. That, of course, was an accidental coincidence, but it was patent that without investigation an actuary would not have been entitled to look for the reproduction of the Manchester Unity sickness among the Hearts of Oak members. Then again he might refer to the case of the Rational Association. The Rational sickness rate had been increasing rather seriously of recent years. It appeared that over a series of years the mining members of the Rational had increased in great proportion with reference to the total membership of the society. Consequently the Rational experience was becoming excessive, not because the rate of sickness had changed, but because a large proportion of members had been infused into the total body of persons whose occupation rendered them liable to the maximum sickness rates known to

actuarial investigators of the subject. Another phase of the problem presented itself in relation to the general change in the rate of sickness. Dr. Snow's investigations had led him to a very distinct conclusion, with which he was in entire accordance—namely, that there was no necessary relation between the rate of sickness and the rate of mortality. Even without the aid of the valuable statistics which Dr. Snow had presented to them, he thought that might be held to be established by comparing the Manchester Unity experience of 1866-70 with the experience of the same society for the years 1893-97. In thirty years the rate of sickness in the Manchester Unity had increased very considerably. At the same time the rate of mortality had declined to a remarkable extent. If there were a close relation between the two experiences, certainly they could hardly expect to find a universal increase in the one and a decrease in the other. It would of course be very interesting if it were possible to find the reason for the increase in the rate of sickness, which could not be otherwise than disappointing in view of the great advance in medical knowledge, sanitary conditions, and the education of the people during the last forty years. If one hazarded a reason, it was probably not to be found in anything capable of statistical expression. It was probably to be found in the increase of the claim habit. Fifty years ago sickness benefit of friendly societies was called a sick gift. For many years, although after a proper contribution was paid for it, it was regarded more in the light of a gift than in the light of a definite insurance. That spirit did not obtain to-day. He desired to correct Dr. Snow's reference to the use of the English Life No. 6 Table, in connection with the subject of National Insurance. The table upon which the financial basis of the Act had been framed was issued in an official publication of the National Health Insurance Joint Committee (Cd. 6292). It would be found on referring to the rates of mortality of that table that it very closely conformed with the Manchester Unity Table of 1893-97. The new table was based on general population statistics, and it indicated that the general mortality rate had so far improved that what in 1893-97 was the experience of a select body of lives had now become the general experience of the whole community. The table had provided therefore to some considerable extent for the increased liabilities due to longevity to which Dr. Snow has drawn attention.

Mr. BARBER said he was particularly interested in what Mr. Watson had said about the sick pay increasing. It appeared to him from his experience that there was a certain amount of heredity about it. The members recalled that their fathers and grand-fathers were members of the society, and they thought that they were going to have the same benefits. The increase in sickness, he thought, was also due to modern conditions of life, which prevented a great many young men from following their occupations continuously.

Mr. P. M. REA said there was one point he would like to refer to—namely, the apparent anomaly existing as to the comparative sickness rates amongst persons who were not insured in any friendly society and those who were. The sickness rate apparently was

lower among those persons, and the converse was the case as regards the mortality rate. It was safe to assume that in a general sense the membership of a friendly society from a health point of view was of better status than in the case of those outside, because a number of those outside were probably not in a fit state to be admitted to membership. Yet they had the apparent anomaly that the inferior lives did not experience any more sickness than the selected lives, yet the mortality rate was higher among them. But he thought, if they looked closely at it, there was an explanation ready. To a man who was insured in a friendly society or two (and he thought the majority of those who were insured in a friendly society were insured in two, and sometimes three) there was a great inducement when a minor illness took place to "lay up," consult a doctor, and take his annuity until he got strong and vigorous; because, when a man was not insured in a friendly society at all, and he had nothing coming in, there was really no inducement for him to "lay up." He must work as long as he could; and he might work too long, which would of course undermine his health and hasten his death, and therefore help the mortality rate among uninsured persons. He said there were a great number of factors which were very important. There was the factor that a man had a larger income when he was ill than when he was working. Then there was another factor—some of the experiences of friendly societies showed a smaller sickness ratio than others, and it might be interesting to know what relation the more rigid supervision in those cases had to the others. Then the cold weather sometimes had something to do with the claims. The claim ratio was always much higher in the winter when the weather was cold, and it was much more comfortable—as a member who "laid up" every winter said—to sit near the fire and smoke one's pipe and read the paper while the snow and cold winds were outside, instead of working. That man was a carman. The Hearts of Oak and all other societies year after year had persons claiming illness periodically, while the large proportion of the membership never claimed anything at all, until finally when they got very ill and they had to claim something. It would be an interesting phase of the question to know how many of the claims which those societies paid went among a very small proportion of the membership. Institutions of that kind had bad members and good members. There was a moral hazard exercising a great influence on the question. Then there was the question as to what influence the National Insurance Act would have on the sickness claim ratio. It was frequently a misnomer to call it sickness, because many members were in quite good health when they became pensioners of the institutions of which they were members. They would also find, as the income of those members got larger, that there was a tendency for the claim ratio to get larger also. They would, no doubt, find that the amount to which they would be entitled under the National Insurance Act would be very appreciably increased, because it was found that most members of friendly societies continued their membership still, and yet they were entitled to their ten shillings also from the State. There was that to consider; and there was also the further fact that friendly societies had very largely

relaxed their rules for admission to membership. Some of them had extended the ages, and the result was that there had been a very large influx of new members into those societies since the introduction of the National Insurance Act. Everything seemed to indicate that the future experience of all those societies would show a marked increase in the claim ratio, and he thought also that the experience under the National Insurance Act would show the same tendency; and instead of underestimating the amount which would be required to meet the claims, he thought experience would show in the future that they had very considerably underestimated it, and would have to provide in the aggregate very much more than they had hitherto paid.

Mr. MOFFREY said that those of them who had endeavoured to guide the destiny of friendly societies had found that instead of stepping into waters in which they were unable to swim, it was better to follow the advice of expert advisers whom they had engaged to train them in the way they should go. They had also found that the most successful societies had been those who followed most closely the actuarial advice given to them, based on the investigations gained from the experience of the societies themselves. Therefore they welcomed any further investigation, in the belief that it might still further help them to achieve the success they all desired in the matter of sickness insurance on sound actuarial principles. Some thought that the National Insurance Act would put an end to any further necessity for those societies troubling themselves, but he entirely disagreed with that. In his opinion the present National Insurance Act had opened up a fresh field of research which would have to be gone into very deeply for the benefit of those concerned, and probably fresh problems would emerge which it would be the duty of the societies to grapple with and solve to the best of their ability, for the welfare of the members.

Mr. A. F. DYMANT said he would like to give a little information on two points—with regard to what Mr. Watson had said as to over-insurance, and also with regard to the inspection of the men who were ill. In the first place it had come to his knowledge a few days ago that a member of a society in which he was interested had asked his medical officer for nine certificates in order that he might make nine claims for sickness. The other point was that the society with which he was connected had had in operation for the last six or seven years a somewhat efficient system of independent inspection. They had an inspector who worked from the head office, and they found they had more than compensated themselves for his salary by the saving in the sickness claims, in addition to which a certain amount of moral effect had been instilled into the members, as they never knew exactly when the inspector was going to call upon them. That, to his mind, was a much more efficient method of checking the sickness claims than the system which was adopted by a very large number of friendly societies, namely, that of the visiting of sick persons by fellow-members residing in the same neighbourhood.

Dr. GREENWOOD said, with regard to the question which two or three speakers had raised as to medical certificates, he had at one time had experience of that, having been brought up in a working-class neighbourhood, where his father was a practitioner. There was this point to be remembered, that the commercial interests of the doctor as a general rule tended to favour his giving a certificate when it was really not necessary rather than to operate in the other direction; because if one refused a man, he might prefer a charge against one at the next meeting of the local court for neglect, and it was quite possible one might lose that club. It occurred to him that that might affect the question of geographical distribution in this way, viz., that in certain districts the clubs might form the main source of the doctor's income, and in other districts the clubs might be few, and they might be divided among the different doctors, so that the club practice only formed a very small proportion of any one practitioner's livelihood. The consequence was that in the latter case there was not anything like the same incentive to the doctor to be sycophantic to the faddy member. That might conceivably be a factor in some of the variations. Another point was as to the question of method. Dr. Snow had introduced an extremely ingenious proposal for dealing with the correction required to allow for the effect of different age-distributions, and he had referred to the case of Mr. Maynard's paper on cancer and diabetes rates. The point the speaker wished to raise was that all these proposals involved an increasing number of correlation coefficients to calculate. He was not quite clear whether in most ordinary statistical practice the additional result obtained by the additional labour was really commensurate with the effort. For example, if they took the case of Mr. Maynard's results and the method applied to them by Professor Pearson in their own *Journal*, the difference which Professor Pearson obtained in the coefficient after much laborious work was extremely slight. As a simple illustration, suppose they considered deaths from two diseases in a common population and that no question of age differences arose; for example, X deaths from one disease and Y deaths from another disease, the population being Z, then all ordinary statisticians considered the ratio of X to Z and Y to Z as measures of the prevalence of disease, i.e., the death rate from that disease. He was assuming that age did not come in. The natural idea would be to correlate, if they wished to proceed by correlation, $\frac{X}{Z}$ and $\frac{Y}{Z}$. But the question had been raised as to the existence of spurious correlation owing to the common population. The method which Mr. Maynard had pursued, and which he thought Dr. Snow usually used, was not to take the rates at all, but to correlate the total number of deaths from one disease X, and the total number of deaths from the other disease Y, each with Z, then to correlate X and Y, and finally to determine a partial correlation $r_{XY \cdot Z}$. Supposing they correlated the two indices with population constant, i.e., found $r_{\frac{X}{Z} \cdot \frac{Y}{Z} : Z}$, then, as a matter of logic, the two partial correlations should be identical, but in actual practice $r_{XY \cdot Z}$ and $r_{\frac{X}{Z} \cdot \frac{Y}{Z} : Z}$ were not always exactly equal for reasons

there was no time to go into. But the point he wished to emphasise was that the coefficients $r_{x \cdot z}$ and $r_{y \cdot z}$ were, in his experience, usually small, with the result that the ordinary total correlation between $\frac{X}{Z}$ and $\frac{Y}{Z}$ was very little different from the partial correlation $r_{x \cdot y \cdot z}$. In most cases also it did not deviate very appreciably from the partial correlation between X and Y , *i.e.*, $r_{xy \cdot z}$. Of course the practical point was that in one case you only required to determine one correlation, but in the other case you must work out three. The labour was more than doubled in the second case. Consequently he was rather inclined to doubt whether in ordinary practice any great error was likely to be caused by using $r_{xy \cdot z}$ instead of $r_{x \cdot y \cdot z}$ notwithstanding the risk of introducing spurious correlation which had been put before them so eloquently by Professor Pearson and others. He suggested that the dangers arising in that way might perhaps in practice be somewhat less than was suggested by theoretical computation, although in important cases the point had to be borne in mind. He heartily supported the vote of thanks.

Dr. SNOW, in reply, expressed his gratitude for the terms used by the proposer and seconder of the vote of thanks. He referred briefly to one or two points in Mr. Watson's speech, and particularly to his remarks concerning the use of the term "expected." He quite agreed that the actuary looked at the term in a technical sense, and that it did not of necessity stand for the best estimate of the amount of sickness or of mortality to be anticipated. But of recent years the results worked out by the actuary for his own purposes had been quoted to an increasing extent by the non-actuarially trained person—particularly with reference to the effect of alcoholic abstinence on mortality—without any regard to the many pitfalls and possible fallacies surrounding the use of the actuaries' terms. It was from this point of view of reaching a better estimate of the sickness or mortality to be anticipated in any particular case that he suggested the possibility of employing regression equations. With regard to Dr. Greenwood's remarks on Mr. Maynard's paper, it was quite true that a certain correlation between indices was found to be practically the same as the corresponding but more complicated partial correlation reached when indices were not employed, but he did not think any general conclusion could be drawn from that. Other similar cases could be pointed out, and also some showing quite different results.

The following Candidates were elected Fellows of the Society :—

Krishna Lal Datta, M.A.

Gerald Frank Shove, B.A.

Rev. J. Frome Wilkinson, M.A.

CENSUS NOTES :—THE UNION OF SOUTH AFRICA.

SOME of the more general features of the enumeration of the Union were reviewed in the *Journal* of last July, since which date further results of the census have been published and notes regarding them have been prepared by Mr. Dale, I.S.O., upon which the following review is based. Unfortunately, space does not admit of the reproduction of the whole of his detailed comment.

One bye-product of the new South African Constitution will be welcomed by students of the statistics of population, viz., the quinquennial census, which the electoral system renders necessary, and which is also justified by the rapid growth of the community. In treating of the density of population in the Cape Colony and its distribution into Urban and Rural, Mr. Dale calls attention to the well-defined geographical zones into which that territory falls, and their difference in altitude, rainfall and orography, none of which is without its influence upon the population and its pursuits. It is probable that similar distinctions exist in the smaller States, and it would be well to recognise them in the analysis of the more general statistics of the census.

The leading feature, however, in the returns is the distinction of race, a distinction which, as pointed out last year by Mr. Fremantle in the *Journal*, underlies every question upon which it is the province of the census to furnish information. The White population amounts to 21 per cent. of the whole. Amongst the 79 per cent. coloured, 67 belong to the numerous local branches of the great Bantu race, 4 per cent. are foreigners, such as Indians, Malays, &c., and a little more than 7 per cent. are returned as of mixed blood. Whilst observing the general division into white and coloured, the census, in most tables, deals separately with the Bantu.

In regard to the White population, the circumstances in which the census of 1904 was taken prevent a fair comparison with the figures of 1911, when the country had been relieved of the greater part of those whom the late war had brought into the various States. For example, the age-returns show the percentage on the total of males of those between the ages of twenty and thirty-five to have fallen from 35.6 to 27.7. The latter figure, however, is well above the 25 per cent. which prevails in this country. In the case of women, the difference between the two census years is comparatively slight, though, as in all colonies recruited largely from abroad, the number of women is, on the whole, far below that of the other sex. There are, in fact, no more than 863 white women to every 1,000 men of that colour, and only 804, if the children be excluded from the reckoning. The former proportion is about the same as that in the population of the three smaller Australian States with which Mr. Dale compares the European population of South Africa—the numbers being about equal—but the proportion of the young in South Africa is somewhat the larger. In fact, this last feature is very prominent in the region in question. The comparative paucity of the old accounts for part of it in the case of the males, but not in

that of the other sex. Perhaps the high ratio of the married amongst women may explain some of it, as over 59 per cent. are in that condition, against 53 in the Australian group and 51 in this country. Bachelors, as is to be expected, are relatively more numerous in the newer countries, but less so in South Africa than in Australia. On the other hand, the Union shows only 569 spinsters to every 1,000 bachelors of over fifteen years of age, but we have 1,064 here. Finally, whereas of the European husbands in South Africa 52 in every 1,000 are without their wives, in this country 21 wives are without their husbands.

Now, the Bantus, who are for the most part at home, have 986 women on the return for every 1,000 men, and the proportion would be higher but for the influx of young adults from beyond the Union into the urban centres. The polygamous reputation of this race is somewhat mitigated by the census returns, which for the first time afford a measure of the prevalence of this habit. Over 85 per cent., in fact, of the men returned as married are the husbands of one wife, a little more than 11 per cent. have 2, and another 3 per cent. 3 or 4. It is only in Natal and the Transvaal that they seem to venture upon more than 10 wives. One bold man, under thirty, in the Orange Free State, seems to have taken unto himself 28 wives, whilst in the Transvaal, a "young reprobate," as Mr. Dale calls him, indulges in 46. It appears, by the way, that about three-fourths of the total population, white and coloured, are classed as rural; about three-fourths of the coloured in the towns are illiterate, and the same proportion, on the whole, return their tribal religion. The coloured people of the Cape Colony are apparently the least illiterate, and those of Natal the most. In the Orange State there is a great difference in this respect between the denizens of the towns and those of the villages, still more between the men and the women. These figures, it must be mentioned, refer only to those over fifteen. The great prevalence of agriculture as the means of subsistence accounts for this neglect of letters. Excluding the persons returned as dependents, 86 per cent. of the female and 62 per cent. of the male Bantu are returned as living by the land. About a fifth of the men have taken to mining, and 6 or 7 per cent. of each sex to domestic service. The White population presents greater variety in its avocations. Again leaving on one side the Dependents, only 38 per cent. of the males follow agricultural pursuits, and mining and mechanical industries account for 30 per cent. In regard to the European women, it is a curious outcome of the system of classification that, even after deducting the 40 per cent. of Dependents, there should be three-quarters of the rest returned as following domestic duties as distinguished from domestic service. The clerk and typewriter of this sex, however, seem to have got acclimatised in the Union, and to some extent mitigate the claim of the home.

There is a good deal in the returns which, even on the surface, requires local knowledge to explain adequately, and the establishment of a Census Office as a permanent Department ought to afford the opportunity for giving a good account of the valuable material collected by the enumerators.

J.A.B.

AN ACCOUNT OF AN INQUIRY INTO THE EXTENT OF ECONOMIC
MORAL FAILURE AMONG CERTAIN TYPES OF REGULAR
WORKERS.

By DAVID CARADOG JONES, M.A.

It is common knowledge that the majority of the men who have appeared in the past before distress committees and who frequent the casual wards of our workhouses belong to the casual class; some of them have descended into that class from good positions, where work was regular, while others have almost inevitably graduated into it through the blind-alley process; in either case, their economic failure is not unseldom associated with degradation of character.

It is not this type, however, which concerns us; the question is to be approached from the opposite end: granting that irregular or casual work is often associated with weakness of character, to what extent is regular work free from the same weakness? If it be almost entirely free, it would seem that we have a very strong argument—not so much on the negative side, because casual work is bad, which has been frequently emphasised, but on the positive side, because regular work is shown to be good—in favour of a more systematic regulation of industry and of a more careful direction of boys at the period when they are leaving school and are so liable to drift into channels which will carry them out later into the sea of casual labour.

The idea of measuring statistically the extent of moral failure among regular workers at once suggests enormous, if not insuperable, difficulties. No figures appear to be available bearing directly on the matter. It might have been possible perhaps to approach poor-law guardians, prison officials, or the secretaries of guilds of help and charity organisation societies in order to try and discover from them the history of some of the cases with which they deal, and to find out to what extent regular workers come before their notice; but this did not seem a profitable course to follow, because very few men step straight from regular work into a state of such acute distress as is usually associated with the above offices, and it was essential for our purpose to catch sight of the worker at the first step in his downward path. A more direct method of attack was, therefore, attempted: application was made to various employers of labour to find out, if possible, how far moral failure existed among their employees.

But here, again, the difficulty of definition presented itself: what is moral failure and when does a man take the first step in his downward path? It was clear that hopeless confusion would result if employers were canvassed upon a matter open to so many and such varied interpretations, and to attempt to trace moral descent numerically would be only to court ridicule.

It seemed quite feasible, however, to make a first approximation towards the solution of the problem by discovering what proportion

of certain types of workers get dismissed in the course of a year for moral failing of one kind or another. It must be pointed out here that this is not necessarily moral failure in its initial stages, but moral failure when it has reached such a pitch in a man as to make it bad economy in the opinion of his employer to retain his services any longer. I have, therefore, called it *economic* moral failure, and it is this mainly which I have attempted to measure; no fixed standard is implied by the term, and the number of dismissals will depend to some extent, perhaps to a considerable extent in some cases, upon the management and discipline maintained.

Again, in order to bring out effectively the influence of *regular* work upon character, even if only economic good or bad character is meant, it would be almost necessary to contrast the proportion of dismissals in a number of cases where work was regular with the proportion in a number of cases where work was irregular, but, supposing material in other respects comparable could be obtained, there is one consideration which would make such a comparison of little value: where there is a constant flux of employment, a man who might otherwise be dismissed for misconduct is often only dismissed when his labour is no longer required; if misconduct is noted, it results in the man being rejected by the foreman the next time he applies for work, rather than in his immediate dismissal.

I have, therefore, been obliged to content myself by collecting returns bearing on employment which is all more or less regular, by arranging these returns under different fairly well-defined heads and by enumerating the results obtained.

A few preliminary inquiries were made in person among various employers of labour to find out the sort of information which one might hope to get, for all who have had experience in the collection of statistics know that it is one thing to put down a number of questions on paper and quite another thing to get them answered satisfactorily and without risk of misunderstanding. Considerable care was therefore taken in wording the questions, and although the result was far from perfect, I am satisfied that in the majority of cases the returns obtained were trustworthy. With each form was sent another giving specimen replies, a copy of which appears at the end of this paper. This served a double purpose; it produced as a rule replies in the form in which they were wanted, and it procured in most cases more information than the questions alone suggested; had the number of questions been increased it is probable that more employers might have hesitated to send any return at all. A letter was also written explaining briefly the purpose of the inquiry, and promising that no names should be disclosed and that the information would be published in such a form as not to indicate the sources from which the particular figures had come. I should like to acknowledge very gratefully the ready response which my request obtained in a great number of instances. I approached altogether nearly 250 employers and managers of public companies controlled by local bodies; I received 120 returns which were judged satisfactory, besides several letters giving information of interest but no exact figures. I received no reply in 42 cases and refusals in

27 cases ; nearly all the refusals were stated to be on the ground of difficulty in getting out such information without much labour owing to incompleteness of records.

Before dealing with the returns themselves a few general remarks upon the questions and replies are necessary. It will be noted that the most important of the questions were (1) and (3), and definite figures were only asked for twelve months ; this was because, in the absence of record, figures covering a longer space of time could scarcely be relied upon, while the actual information sought could usually be given with little trouble, and this was an important consideration. The purpose of question (4) was to determine whether the figures for the last twelve months might be taken as fairly typical of those for previous years so that a judgment might be formed as to the relative value of the return if the percentage of dismissals appeared to be very large or very small. Question (2) was asked in order to find how far irregular labour was employed side by side with regular labour. Question (3a) was to discover whether the business was a growing or declining concern ; it should give a rough test of the ability of the management. Finally, the replies to questions (5) and (6) should be of assistance in estimating the conditions of employment.

The form as drawn up was applicable only to a small firm, and it would have been useless to send it without further explanation to the managers of very large firms or companies employing hundreds of workers of different grades ; in such cases a return was only asked for one or two sections of men doing the same kind of work and who, though fairly typical of the whole staff, might be treated in filling up the form as if they were quite independent of the rest.

To render the statement of results clear they may be conveniently divided into four main types :—

I. Government service.

II. Municipal service.

III. Service with large companies or firms of the company order.

IV. Service with small companies and private firms.

Each return has been placed under that heading which appeared to define it best ; the division has not been followed rigidly.

I. Government Service.

Figures were obtained from Blue Books and Official Reports concerning the Army, Postal Officials, Poor Law Officials and the Metropolitan Police. On account of the dissimilarity of the material and the great difference between the numbers involved, the results are given separately though in the same table. (See next page).

The Regular Army record was examined in more detail for the year 1910-11 ; the percentage of dismissals only varied from 0 to 1 in the different ranks and the mean percentage for all ranks was .73. The percentage of convictions by Courts-Martial to average strength during the year was 2.15 ; the mean figure for the years 1902-09 was 3.68, but the decrease was partly due to increased powers of commanding officers. The percentage of fines for drunkenness—a soldier being liable to a fine if he is caught drunk

twice—was 4·46 as against 5·71 for the years 1906-11. The percentage loss to the force through desertion was ·70 as compared with ·63 for the period 1902-11. Similar figures were available for the Reserve Forces. The mean percentage dismissed per annum in the Army Reserve (mean annual strength 114,049; 8 years' record) was ·22; in the Special Reserve (mean annual strength 75,637; 7 years' record) it was 1·17; in the Territorials (mean annual strength 246,487; 3 years' record) it was ·48.

Class.	Year.	Number employed. Mean of strength at beginning and end of the year.	Number dis- missed.	Per cent. dis- missed.	Arith- metic mean of numbers in last column.
Regular Army (N.C.O.'s and men)	1903-04	277,038	3,656	1·32	} ·94
	'04-05	267,404	3,090	1·16	
	'05-06	255,589	2,121	·83	
	'06-07	243,859	2,119	·87	
	'07-08	237,933	2,254	·95	
	'08-09	240,357	2,055	·85	
	'09-10	241,067	2,026	·84	
	'10-11	241,551	1,762	·73	
	1903-11	2,004,798	19,083	·95	
Police (Metropolitan)	1901.....	15,977	60	·38	} ·23
	'02	16,374	76	·46	
	'03	16,517	33	·20	
	'04	16,846	32	·19	
	'05	17,210	35	·20	
	'06	17,743	28	·16	
	'07	17,919	32	·18	
	'08	18,167	47	·26	
	'09	18,657	25	·13	}
	'10	19,418	19	·10	
	1901-10	174,828	387	·22	
(Provincial town, A).....	1907-11	10,208	100	·98	
(" B).....	'08-11	5,012	3	·06	
All police together	—	190,048	490	·26	
Postal officials (Establish- ment staff)	1909-10	96,952	222	·23	} ·22
	'10-11	98,970	214	·22	
	1909-11	195,922	436	·22	
Poor Law officials—	1910				
Medical officers	—	1,053	4	·38	} ·43
Nurses and assistants ..	—	6,991	25	·36	
Masters, stewards and superintendents	—	824	4	·48	
Relieving officers	—	1,689	12	·71	
Other officers and assis- tants	—	4,853	11	·23	
All Poor Law officials	—	15,410	56	·36	

Among Post Office employees, 60 per cent. of the losses of good conduct stripes for the year 1910-11 were attributed to intemperance; 28 per cent. of the actual dismissals were due to intemperance and 42 per cent. to dishonesty.

A statement was given of offences within the Police Force in the town A, the number of such offences, expressed as a percentage of the strength of the force, being 4·2, 1·6 being due to intemperance. In the town B, the percentage dismissed and reduced was ·14 per annum, the corresponding figure for postal officials being ·43.

These figures are quoted because they indicate the amount of misconduct within the services which is not penalised to the extent of dismissal.

Under this same heading may be mentioned some figures referring to (1) elementary school teachers and (2) clerks, both these being cases where dismissals are exceedingly rare. Out of two counties, where 5,763 school teachers were engaged, only one was dismissed in the year for which the record was given. Also, out of 7 firms in which altogether 720 clerks were engaged, 4 were dismissed in the year recorded. These figures are probably too small to be fairly regarded as giving any standard for comparison with other regular workers.

II. *Municipal Service.*

This type includes Tramway, Waterworks and Gasworks employees under the control of local authorities. Also returns were in a few instances obtained with regard to other corporation servants, such as road-workers, scavengers, dustmen, &c., but this class usually contains a nucleus of men who are kept on regularly, and a fringe of men varying in numbers, who work only for a few weeks at a time, no proper record being kept of either, and it is extremely difficult to get reliable figures because the nucleus and the fringe cannot clearly be separated; the difficulty is accentuated owing to a tendency on the part of employers, when a regular man misbehaves, to take him on as a casual instead of dismissing him altogether, and, as previously mentioned, when a casual is dismissed, in order to avoid any possible trouble, no other explanation is given as a rule except that his labour is no longer required; this would vitiate the results if we wished to make any comparison with other employees of the municipal service type, and the figure given in the table is, therefore, of little value. Another fact which is to be borne in mind throughout the discussion is that some qualities are indispensable in one class of work while they are not quite so important in another class; *e.g.*, it is essential for a tram-conductor to keep to time, but a roadmender may take his own time so long as he escapes the foreman's eye.

It will be noted that the numbers employed in different towns varied very considerably and each class has, therefore, been subdivided so as to show how the proportion of dismissals in the smaller towns differed from the proportion in the larger towns: had this not been done the results in the former would have been completely disguised by those in the latter. All the returns which seemed reliable have

been included ; one which occurs under the heading of gas-workers appears abnormal, but the year was recorded as typical and there seemed to be no reason for doubting its validity : it has, however, been separated from the rest and it is rather interesting as showing the possible effect of a single large return upon the general average. In the case of waterworks employees, 12 towns, representing altogether 698 workers, recorded not a single dismissal during the twelve months.

Class.	Number of towns.	Total employed.	Average number per town.	Percentage dismissed.	Per cent. of total dismissals due to			
					Drink.	Dis-honesty.	Misconduct.	Negligence, Irregularity.
Tramway employees	5	454	91	2.64				
	5	1,391	278	3.02				
	4	3,025	756	1.39				
	4	13,401	3,350	1.03				
	18	18,271	—	1.28	19	10	10	61
Waterworks employees	10	508	51	.39				
	6	1,198	200	.42				
	2	3,273	—	.46				
	18	4,979	—	.44				
					35	8	10	48*
Gasworks employees	5	885	177	1.24				
	4	2,064	516	1.02				
	1	1,332	—	.00				
	10	4,281	—	.75				
Other corporation employees	5	3,517	—	.46				

* Here and elsewhere in the paper the percentages do not add up to 100 necessarily, because they have only been taken to the nearest integer.

It will be seen that an attempt was made in the inquiry form to separate skilled from unskilled workers ; the term skilled is, of course, open to different interpretations, but so long as we were dealing with workers in the same line, a certain amount of agreement in definition might have been expected ; this, however, was not the case ; it was discovered, for example, that some tramway managers regarded motormen and conductors as skilled workers though the majority regarded them as unskilled, and at least one treated motormen as skilled and conductors as unskilled. Taking men in the repairing sheds only as skilled and taking motormen and conductors as unskilled, the percentage of dismissals among the former was 1.94 and among the latter 1.39. The results in the case of gas-workers, following the division given by the managers themselves,

were '59 for skilled men and '67 for unskilled. We can only conclude that these figures at all events do not indicate a much greater frequency of dismissals among unskilled workers as compared with skilled workers, when both are in regular employment.

An attempt was also made to distinguish between better-paid and worse-paid workers, based upon replies to question (5). When the wage was given between limits, the sum half-way between those limits was taken as a rough average for the bulk of the employees under consideration. The total employed in each class was divided as nearly as possible into two halves; for tramway-men the percentage of dismissals in the better-paid half was '99, and in the worse-paid half 1'81; for gas-workers the corresponding numbers were '21 and 1'36. In the case of gas-workers, however, when only the 9 smaller towns were taken into account, the division better-paid and worse-paid agreed exactly with the division skilled and unskilled, and if only enough returns had been available it would have been more satisfactory to divide them first into skilled and unskilled and then to further sub-divide each of these classes into better-paid and worse-paid so as to separate the two factors.

It was not always easy either to place the various reasons given for dismissal under their proper headings; "drink" and "dishonesty" were clear enough, but the lighter forms of misconduct, shading off into "bad time-keeping," "negligence" and "inefficiency" were more doubtful. "Inefficiency," where not due merely to carelessness, should not have been recorded as moral failure in the sense implied, and when recorded it has been assumed culpable. The term "irregularity" was variously taken to mean "breaking rules," "keeping bad time," "not turning up to work," "immorality." It will be seen that 61 per cent. of the total dismissals among tramway workers were put down to "negligence, &c.;" if the returns were correctly read, this could be sub-divided again into 26 per cent. negligence, 20 per cent. irregular attendance and unpunctuality, and 15 per cent. incompetence, culpable or otherwise. In the case of gas and water employees, taken together because of the smallness of the number, 24 per cent. might be attributed to negligence, 20 per cent. to irregular attendance and unpunctuality, and 4 per cent. to incompetence. It is interesting to compare the figures for tramway-workers with those for the other workers; there is probably more temptation to be dishonest among tram-conductors, and tramway workers in general would be quickly penalised for unpunctual or irregular attendance, while the fact that they come under the direct notice of the public might be expected to raise the general standard of temperance among them.

III. *Service with large companies or firms of the company order.*

In the next table the letters A, B, . . . L stand for different firms or companies. The employees in A, B, . . . I, though doing very different work, are all, broadly speaking, of the same type, the factory worker type; some of the percentages stand out as exceptional but there is every reason to believe that the figures given are to be relied upon. It is interesting to note that the percentage of

dismissals for men is in every case greater than that for women, and for the combined totals (A, B, . . . I) the ratio is roughly rather more than 2 : 1. The firm I is shown in isolation and in combination with the others because the *number* of dismissals recorded for I was so great as to make a very marked difference in the combined percentages as is shown in the table. As a matter of fact the percentages obtained by adding up all the employed and all the dismissed for all the firms together are not of much statistical significance owing to the heterogeneous nature of the material; they merely show that out of this particular mixed total of over 27,000 persons (A, B, . . . I), possessing this characteristic in common—that they were all regular workers, the proportion of dismissals was about 25 per thousand; such a broad average is however not entirely without value as it supplies a standard by which we may compare dismissals in individual firms within the group. It might be urged against the average as calculated that it gives unfair weight to the larger firms; *e.g.*, although the percentage of dismissals in G is big, the number employed is small, and therefore the number of dismissals will not be so large as to affect the general average as much as it should. We may give each firm its due weight if we adopt another average—namely, the arithmetic mean of the averages obtained for all the firms separately; the results given by this method are 2·39 for men and women together, 3·69 for men alone, and 1·37 for women alone; these numbers are to be compared with 2·48, 3·78, and 1·55 shown in the table; they do not differ very widely.

Class.	Total employed.	Per cent. dismissed.	Males employed.	Per cent. dismissed.	Females employed.	Per cent. dismissed.
A	5,641	·48	2,191	·73	3,450	·32
B	4,716	·15	1,650	·30	3,066	·07
C	4,886	2·86	951	4·94	3,935	2·36
D	2,653	·42	2,149	·51	504	·00
E	2,270	·18	1,620	·25	650	·00
F	1,219	·16	—	—	—	—
G	778	7·06	460	9·78	318	3·14
H	454	1·32	365	1·64	89	·00
A, B, . . . H	22,617	1·11	9,386	1·43	12,012	·96
I	4,895	8·85	2,893	11·40	2,002	5·10
A, B, . . . H, I	27,512	2·48	12,279	3·78	14,014	1·55
J, K, L	15,925	1·68	15,925	1·68	—	—
A, B, . . . K, L	43,437	2·19	28,204	2·59	14,014	1·55

The employees in the three large companies, J, K, L, were all doing the same kind of work, but they were of quite a different type to the factory workers in the firms A, B, . . . I. If all these firms and companies are combined we obtain 22 per thousand as the mean proportion of dismissals for the 43,437 regular workers concerned, 26 per thousand for the 28,204 males and 15·5 per thousand

for the 14,014 females. Since the numbers on which they are based are fairly large, these averages may afford a rough criterion—only in the absence of any other and to be treated with the utmost caution—for judging firms which are outside the group.

The division, skilled and unskilled, for large firms agreed exactly with the division better-paid and worse-paid; the percentage of dismissals for skilled males was 4.00 and for unskilled 4.12: for skilled females it was 1.41 and for unskilled 1.71. The difference is certainly not very pronounced, and in the case of males, when the firm I is omitted, the result is reversed, becoming 2.20 for skilled and 1.84 for unskilled men. This would seem to bear out the conclusion suggested by the figures in the Municipal Class, that unskilled workers in regular employment are no more prone to dismissal for moral failure than skilled workers.

It is worthy of note that out of 432 dismissals recorded in the firm I, 427 were attributed to negligence and irregularity, and the remaining 5 (all men) to intemperance. For workers in the other firms the distribution of dismissals is shown below. If these figures can be trusted, women workers would appear to be more temperate but less honest than men judging from their effect upon the proportion of dismissals.

Firms concerned.	Percentage of total dismissals due to .			
	Drink.	Dishonesty.	Misconduct.	Negligence and irregularity.
A, B, . . . H—				
Males and females	5	29	31	44
Males alone	8	17	34	42
J, K, L—all males	19	2	2	77

IV. *Service with small companies and small private firms.*

Number of firms.	Total employed.	Average per firm.	Per cent. dismissed of total employed.	Per cent. males dismissed of males employed.
6	401	67	3.24	3.80
5	573	115	3.40	not all separable.
4	676	169	1.92	2.06
1	1,045	261	2.30	not all separable.
3	899	300	1.78	2.33
22	3,594	—	2.39	—

The different firms represented in the above table were engaged in many different kinds of work, but employment in each was regular and steady throughout the year, and it is worthy of note that the broad average of dismissals obtained for all the workers combined, namely 2.4 per 1,000, should be in such close

agreement with the corresponding average for mixed factory workers in the case of large firms, 25 per 1,000. This agreement must not be pressed too far, however, because the results will clearly be affected by the proportion of the two sexes in the different totals, and as some of the returns in the present class did not distinguish between males and females, it was impossible to say how exactly they were distributed. The Arithmetic Mean of the separate averages for all the 22 firms was also calculated, and the proportion of dismissals obtained on this basis was 27·5 per 1,000.

The number of females that could be separated from the total was only 613, with one dismissal; this number is probably too small to give any safe conclusion, but it indicates a much smaller percentage of moral failure among women than among men.

The total number of males that could be separated was 2,234, giving 21 per 1,000 as the proportion of dismissals; this number may be compared with the 26 per 1,000 given in the case of large companies for all the male workers employed.

As in the case of municipal service, so here, the same tendency may be observed for dismissals to be greater in proportion as the numbers employed decrease; this may be partly due to the fact that misconduct escapes notice longer where there are a larger number of men to be looked after.

The percentage of dismissals for skilled males was 31, and for unskilled 24·0; for the better-paid half of males it was 13·9 and for the worse-paid half it was 14·0; here again the numbers were too small to make a division of skilled and unskilled separately into better-paid and worse-paid. The division by pay is probably the more satisfactory of the two, owing to the difficulty of defining skill, and according to that division there is no appreciable difference between the two halves.

The reasons for dismissal are shown in the following table:—

Percentage of total dismissals attributed to:—						
	Drink.	Dis- honesty.	Mis- conduct.	Negli- gence.	Irregu- larity.	Incom- petence.
Males alone	14	8	8	39	25	6
Males and females together	13	11	6	31	36	3

Note again the tendency of the mixture of women with men to increase the dishonesty percentage and to lower the intemperance percentage in agreement with conclusions suggested by the large company figures.

In the cases so far considered under this head the numbers employed in each firm have not been very small so that a single year's record has had some value, but statistics were also obtained for 16 very small firms, employing males only, the average number per firm being 17. In 10 of these, figures were given covering a number of years, and, in calculating the percentage of dismissals for these 10, the number of years was multiplied by half the number

of employees in each case; *e.g.*, if, in a firm employing 14 men, 2 were dismissed in 5 years, the proportion of dismissals would be taken as 2 out of 35; this was in order to allow enough margin for possible increase in the number of employees during the period concerned: the $\frac{1}{5}$ is quite an arbitrary fraction, but it ought to be well on the safe side. The percentage of dismissals calculated on this basis was '87.

Seven firms still remain which differ from those previously considered in that their trade was not steady: it varied considerably throughout the year and consequently a large staff of irregular workers was usually employed side by side with the regular men; owing to the difficulty of separating these two classes, the figures given, which refer only to the regular staff continuously employed, can only be taken as approximate.

The total number of employees concerned was 534, all males, an average of 76 to each firm, and the mean percentage of dismissals came to 8'99; where it was possible to separate skilled from unskilled the figures were: skilled, 5'97 per cent.; unskilled, 11'65 per cent.

These results are in marked contrast with those found for workers where the volume of employment was steady and constant, but the cases are too few to be pressed; they are in general agreement, however, with some interesting estimates submitted by one of the chief representatives of a very large firm of contractors employing a regular staff of 1,500 men, exclusive of clerks, engineers and foremen, and engaging in works of construction, road-making, main laying, railway, dock, and sewer work, &c. In this firm an additional staff of anything between 2,000 and 4,000 might be employed according to the particular work in hand; some of these men might be retained for three years on a big contract but they were not classed with the regular staff inasmuch as perhaps 90 per cent. would be discharged at the end of it. Each foreman or engineer would have practically a free hand in the engagement and dismissal of under workmen such as carpenters, bricklayers, navvies, &c., and a certain number of these, who were picked men, would be kept in regular employment; they would constitute the regular staff of 1,500 mentioned. Regarding dismissals from the regular staff this correspondent's remarks are perhaps worth quoting:—

"Our business gives little temptation to dishonesty, and the number of dismissals under this head may be given as about 12 per annum. Of other causes, intemperance, unfortunately, is the greatest failing, although rapidly diminishing. Perhaps 70 or 80 were dismissed last year for this cause, say 5 per cent. Neglect of work might account for the dismissal of 40 to 50 in the same period. Irregularity is not much in evidence as it means loss of money, and there is consequently a great inducement to come to work regularly; the men who neglect to do so are among the first to be discharged when work is slack so that they lose their position on the regular staff. To summarise generally, fluctuations of work give frequent

opportunity for weeding out undesirable men so that the regular staff are all picked men. There is no doubt in my mind that irregular employment is almost invariably associated with one of the moral failings indicated in your printed form, but, in many instances, when these men have had an opportunity to get into regular work they have improved in a remarkable manner."

The approximate figures, based upon the above estimates for dismissals, is 8.80 per cent., which is surprisingly near the 8.99 per cent. found by combining the seven firms, but the agreement is probably more accidental than real; the dismissals were distributed as follows:—

	Percentage of total dismissals attributed to		
	Drink.	Dishonesty.	Negligence and irregularity.
7 firms.....	51	0	49
Contractor's estimate	57	9	34

A table has been drawn up below giving a general summary of most of the dismissal percentages.

Summary table.

Class.	Number dismissed.	Percentage of dismissals attributed to				
		Drink.	Dishonesty	Misconduct.	Negligence or irregularity.	Incompetence.
Postal officials	214	28	42	30 to	other causes.	
Tramway men	234	19	10	10	46	15
Water and gas men.....	51	35	8	10	44	4
8 companies (A, B, . . . H) } (males and females)	159	5	20	31	44	0
Same companies (males alone } where separable)	89	8	17	34	42	0
3 companies (J, K, L)	144	19	2	2	77	0
22 smaller companies (males } and females)	91	13	11	6	67	3
Same companies (males alone } where separable)	51	14	8	8	64	6
7 firms—trade variable (males)	45	51	0	0	49	0
Contractor's estimate	132	57	9	0	34	0

Note.—The numbers in Col. 2 do not represent the total dismissals in each class, but only those for which definite reasons were assigned.

It should be added that in asking for returns from private firms and companies, some kind of introduction was necessary owing to the nature of the inquiry and this necessarily limited the field of investigation, but, otherwise, the selection of employers was not consciously biased in any way; no introduction was used in getting returns of other types.

I have to thank Mr. J. St. George Heath, to whom I am indebted for originally suggesting the idea which prompted this investigation, and Professor E. C. K. Gonner, for very kindly reading the Paper through when it was completed. I am too sensible of the many difficulties involved to feel at all confident with regard to the results obtained, but I do not think that the discussion will have been altogether valueless if it suggests other questions and perhaps a better method of attacking this one again.

Copy of forms used in the inquiry.

An inquiry into the effect of regular work upon the worker.

-
- | | Skilled. | Unskilled. |
|---|----------|------------|
| 1. What is the present number of your regular workers who work continuously for you throughout the year? | | |
| 2. Do you employ any extra labour (in addition to your regular staff) during busy seasons? | | |
| 3. Of your regular staff -
(a) How many have been taken on during the last twelve months?
(b) How many have been dismissed during the last twelve months for some moral failing ? (Indicate if possible the nature of the moral failing; <i>e.g.</i> , intemperance, dishonesty, neglect of work, or irregularity.) | | |
| 4. Do these numbers which you have recorded for the last twelve months give a fair indication of the proportion of dismissals which have occurred in previous years? | | |
| 5. What is the average weekly wage of the bulk of your regular workers? | | |
| 6. Have you any pension or similar scheme for the benefit of your workers? | | |
-

An inquiry into the effect of regular work upon the worker.

	Skilled.	Unskilled.
1. What is the present number of your regular workers who work continuously for you throughout the year?	9 Men. 2 Women.	32 Men. 11 Women.
2. Do you employ any extra labour (in addition to your regular staff) during busy seasons?	1 Man.	15 Men 7 Women } <i>During the Winter Months</i>
3. Of your regular staff—		
(a) How many have been taken on during the last twelve months?	1 Man.	7 Men. 2 Women.
(b) How many have been dismissed during the last twelve months for some moral failing? (Indicate if possible the nature of the moral failing; e.g., intemperance, dishonesty, neglect of work, or irregularity.)	1 Man—drink.	3 Men—drink. 2 Men—neglect of work. 1 Woman—drink.
4. Do these numbers which you have recorded for the last twelve months give a fair indication of the proportion of dismissals which have occurred in previous years?	Yes, during recent years, but about ten years ago there used to be a good deal of drinking among the men; the drinkers have been gradually weeded out.	
5. What is the average weekly wage of the bulk of your regular workers?	28 6 to 35 -, Men. 25 -, Women.	18 6, Men. 15 9, Women.
6. Have you any pension or similar scheme for the benefit of your workers?	No.	

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*La question de la population.* Par Paul Leroy Beaulieu. iv + 542 pp., Svo. Paris: Felix Alcan. 1913. Price 3 francs 50 cents.

The population question, like the poor, is always with us, and, like them, it has its different phases. Towards the end of the eighteenth century, in both France and England, it took the form of a dread lest, at the banquet of life, there should not be enough to go round, owing to the excessive number of guests. At the French Revolution a practical turn was given to this conception, since, according to Taine, it was suggested that the popularity of the guillotine might be utilised to reduce the population to the 5 or 6 millions for whom the local resources were deemed to be comfortably sufficient. The advisability of preventing the undue increase in numbers found its strongest advocates in the Economists, in those who would be now called by the ill-defined name of Socialists, in the Benthamites and their short-lived successors—the Philosophic Radicals. The hapless Malthus was, of course, pushed to the front of the fray, and to his views on the subject a considerable portion of the present volume is devoted. Even at the end of last century, the spectre of over-population was still walking, though the horizon of its maleficent influence had been placed at a greater distance. In 1890 Mr. Ravenstein, who has recently passed from among us, foresaw a time when the whole surface of the earth will be required for cereals, and no room being available for pasture, the world will perforce become vegetarian. On the other hand, another leader in scientific thought anticipated a somewhat earlier limitation of the possible output of corn; whilst M. Berthelot, of equal renown—agreeing with Mr. Ravenstein that the world will cease to live by carnage and the slaughter of animals—prophesied a similarly wholesale abstention from vegetable diet, since mankind will have come by then to recognise the advantage of living on tabloids and capsules manufactured, independent of sun and rain, in the chemist's laboratory. It may be thought, in passing, that in these circumstances the drinking of healths at the banquet of life, if not obsolete, would be wanting in good cheer.

During the last thirty years, however, the aspect of the question has entirely changed, at all events in the West. On statistical evidence of a scope far wider than that within the reach of Malthus and his contemporaries, it has been found that in no country, even under the conditions most favourable to multiplication, has the

population shown a tendency to increase at anything like the rate anticipated at that date. Furthermore, the rate of increase shows everywhere a tendency to decline. The increasingly important factor of migration must, of course, be taken into account, and the influx of adults into countries like the United States, Argentina, Canada and Australia, an influx which in due course adds considerably to the births, has to be set against the retarding influence of their departure upon the natural increase of the lands of their origin.

Into the nature and causes of this phenomenon, M. Leroy Beaulieu has been a diligent inquirer for the last thirty years and has already published three or four volumes on the subject. On this occasion he takes a rather wider sweep, and reviews the main features of the recent movement of population in what may be called for convenience the civilised, or more correctly, the White Man's, World. These features are no doubt familiar to most of the readers of this Journal, and several of them have been subjected to statistical analysis more searching than that which the author requires for the elucidation of his thesis. The crude birth-rate, or the ratio of births to total population, is declining almost everywhere with increasing rapidity, but, as the mortality or ratio of deaths has also declined and generally to a still greater extent than the birth-rate, the rate of natural increase has fallen off in a relatively smaller degree. The improvement of vitality, however, among infants, though very marked, has a less influence upon the community as a whole by reason of the smaller field to which it is being restricted, while there has been also a very considerable improvement in the vitality of those past middle life. The population, therefore, is ageing, and though for years to come the ratio to the total of those of reproductive age is rising, the time is approaching when, if the present tendency is still operative, greater weight will accrue to the portion of the community requiring support for a period gradually lengthening, whilst the aggregate of those supporting them is receiving gradually diminishing reinforcement from below. This process has been manifest in France for a longer time than in any other country, and it is only to be expected, therefore, that the author should have his eye upon the circumstances of his Fatherland throughout his review of the situation as a whole.

His general conclusion is that the decreasing fecundity of nations is a function, as it were, of their respective advance in civilization upon modern, or, as he terms it, democratic, lines; inasmuch as in the growing competition of wants and aspirations and the means of satisfying them, together with the lessening value of the child as contributory to the immediate resources of the family, a numerous progeny infringes upon the full circle of the enjoyment of life, and is thus held to be an additional burden by some and a bore by others. Nevertheless, marriage is quite as popular as of yore, but from the standpoint of companionship or convenience, not of reproduction, the latter being a consequence intentionally restricted, or placed in the distant background of conjugal life. The author, it

will be seen, has no use for the theory of physiological change current in the last generation, nor, indeed, for that of racial difference in temperament; and he only admits the undoubted influence of the Roman Church upon the fecundity of its adherents in consideration of the fact that it is in the communities less advanced intellectually and in material prosperity that its hold is effective in this respect. The examples with which his conclusions are fortified will not be accepted, perhaps, by all without more detailed analysis, but they are undeniably interesting and suggestive. In France itself, he differentiates from the rest, in regard to fecundity, the Departments of Brittany and Lozère and the Hautes and Basses Alpes, all of which may fall into his category of both primitive and pious tracts. Then come Corsica and the North-Western Departments, the population of which is hardly pure French by race. In treating of the United Kingdom, however, he draws no distinction between Ireland and Great Britain, in spite of the remarkable difference in their conditions. In the case of Belgium he contrasts the low fecundity of the Walloon, or quasi-French provinces, with the higher figure of the less prosperous but Flemish provinces, and shows that the rural tracts of the former section are substantially on the same low level of fecundity as the industrial. Similarly, in Switzerland, he finds the birth-rates in the French-speaking but prosperous Cantons of Geneva and Vaud far below that of the comparatively poor and mountainous German-speaking tracts further to the north and east. He does not mention Zurich, however, which, from its great industrial development, ought to fall into line with the Liège and Namur districts of Belgium. The same remark applies, perhaps, to the omission of the Rhenish provinces in treating of Germany, and the inclusion of Westphalia amongst the more backward provinces of that Empire. Notwithstanding points such as the above, which are open to controversy, the occasional want of depth in the handling of vital statistics, the use of different periods for comparison and a certain amount of repetition and restatement, the volume contains much valuable information and argument. The question in which the author is evidently most deeply interested is the means of infusing into France a public spirit favourable to the increase of the population in place of the present acquiescence in a stationary or declining tendency. Into this part of the work it is not necessary to enter here, though it is not irrelevant, in considering the conditions and tendencies on this side of the Channel, to bear in mind the warning note struck by M. Leroy Beaulieu, that there is a relative decline, even in an increasing community, which may prove in time to be as politically dangerous as an absolute decrease.

J.A.B.

2.—*The distribution of incomes in the United States.* By F. H. Streightoff, M.A., Instructor in Economics, De Pauw University. 171 pp., vol. lli, No. 2. *Studies in History, Economics, and Public Law.* 8vo. New York: Columbia University, 1912. Price 7s.

The object of this book is to show that "up to the present time there has been no satisfactory study of the distribution of incomes

in the United States; and, second, that the material for such a study is not now available." In ten pages at the end "a simple and effective method of obtaining this material" is suggested.

After some introductory pages on the utility and the ideal form of income statistics, the sources of incomes are discussed. Personal incomes are taken as derived "from labour, from the ownership of property, and from the rights of private property." Under the former heading comes "the earnings assigned to men for their work," which are sub-divided into three classes:—(a) "salaries," when the remuneration is determined in advance by definite agreement and the time unit is a year; (b) "wages," or remuneration similarly determined but where the time unit is less than a year; (c) "contingent earnings," or "those forms of compensation which depend in a peculiar degree upon the skill, energy, and good fortune of the recipient. Under this head would fall, for example, the commissions of salesmen and of brokers, the 'profits' of the farmer and shop-keeper (except interest on capital), the incomes of physicians and lawyers, and a large part of the speculator's gain." Curiously enough the author does not specifically mention the remuneration of manufacturers under this heading of "contingent earnings," to which a large part of it should apparently belong, and the example taken of a mixed income is that of a professor drawing a salary for teaching, wages for temporary office work, and contingent earnings (in the shape of "large checks") for scientific articles. Professors in the United States are apparently more fortunate than their brethren in Europe! The distinction between salaries and wages is not of much importance, and the third class of contingent earnings is too diversified to be usefully treated as a whole. The second class of incomes from the ownership of property is clear enough, but under the third class of incomes from the right of private property are included gifts, bequests, and inheritances. As the author admits that an income of this class "is not normally a part of the distribution of products, but is rather a transfer of the ownership of capital," it is simply confusing the issue to treat it as income at all.

The existing sources of American income statistics are analysed with much care and their deficiencies set forth. The author concludes that "of the 29 million persons gainfully employed in 1900, about six-tenths were wage-earners, nearly one-tenth were on salaries, and approximately three-tenths enjoyed contingent incomes." "A determination of the number of persons enjoying incomes from property is impossible on the basis of existing data: it is not known how many persons are interested in real estate, how many are holders of industrial or railroad stocks, or how many own United States bonds." Figures as to the distribution of revenues from property are, naturally, wanting, but the great mass of wage data published by the State Bureaux of Labour and by the Federal Government yield some results. Between four and five-tenths of the industrial families are entirely supported by the earnings of the father-husband. Wages since the close of the Civil War have risen little in money but very much in purchasing power, but between 1890 and 1904 the

author thinks that it is doubtful whether there has been any increase of real wages as measured in the purchasing power of food. "A consideration of the evidence found in all the available reports leads to the conclusion that in 1904, and probably at the present time, at least half of the males aged sixteen or more, engaged in gainful occupations were earning less than \$626 a year." Money wages since 1904 appear to have improved, but the cost of living has also risen. Some other gleanings from the reports are given, but it is a somewhat melancholy reflection that the net result of so much labour of compilers and tabulators, and of the covering of such a vast extent of paper with figures in columns, is so small.

Mr. Streightoff proposes to ascertain the distribution of incomes by obtaining data as to rents paid. There should be added to the schedule for the Census of Agriculture a question requiring a statement of the rent or mortgage interest paid, the answer to which, in conjunction with the other information now required to be given, would enable agricultural incomes to be calculated. To the Population Census schedule there should similarly be added a question calling for the rent or rental value of the house or tenement occupied by the family. Voluntary information should also be collected from a large number of families showing the relation of incomes to rents, and on the basis of this distribution the distribution of incomes for the whole community could then be calculated. On this scheme it is only necessary to observe that its advantages would depend entirely on the representative character of the sample, both as regards localities and industrial or income groups. The uncertainty attaching to all voluntary returns is very great.

H.W.M.

3.—*Les Revenus de l'Etat*. Par N. G. Pierson. Traduction Française d'après la deuxième édition Néerlandaise, par Louis Suret. 386 pp., 8vo. Paris: M. Giard et E. Brière. 1913. Price 12 francs (broché).

At such a time as the present, when the great Powers are engaged in a competition of spending, and most European and some extra-European governments are making strenuous efforts to discover new sources of revenue (and are having recourse to some desperate expedients), an attempt at the formulation of sound economic principles and at scientific criticism of current financial methods should be assured of a cordial welcome. We may even venture to hope (though we are not very optimistic) that it may receive some attention from statesmen and administrators when made, as in this instance, by one of themselves. The volume before us presents in French guise the fourth part of that manual of general economics by the late distinguished Dutch statesman, Dr. Pierson, which has already won for itself an important place in the literature of economic theory, and has been made available for English readers by the labours of Mr. Wotzel.

This latter fact must, we fear, affect adversely the reception of M. Suret's careful and (so far as we can judge) meritorious version in this country, where otherwise it would have been very useful. The recently-published second volume of Mr. Wotzel's admirable

translation not only reflects greater credit on his publishers, but it is, even nominally, only a trifle more expensive than M. Suret's volume, and the difference is more than offset by the fact that it contains not only Dr. Pierson's discussion and criticism of state revenues but also the whole of that part of his work which is devoted to Production. This seems to us a matter of very real importance, for whilst Dr. Pierson's analysis and criticism of state revenues and forms and methods of taxation, and his exposition of the principles which should be adopted, can no doubt be studied by themselves, they can, we venture to think, be appreciated at their true value only when considered in conjunction with his general economic theories, and particularly those relating to Production. Even the student whose interest in discussions of such general principles is small will, in the course of his reading of the sections devoted to taxation, be glad to be able to turn to the earlier part for further light on some points.

We have already indicated the character of that portion of Dr. Pierson's work now before us. Its various sections deal with State domains, fees (defined as the charges made in respect of services rendered by any institution provided by governmental authorities in the public interest, and not for purely fiscal purposes), the theoretical and practical problems of taxation, and loans. It is not possible in this place to summarise Dr. Pierson's views—still less to enter upon an examination of them; it must suffice to say that on such questions of present importance as land taxes, increment value duties, general property taxes, and loans, they always merit careful consideration, even though (as is sometimes the case) the principles formulated do not appear to be very definite. On all matters relating to customs duties Dr. Pierson writes as a strong Free Trader, but, on the other hand, it is noteworthy that there is no discussion of the problem of State ownership and working of public services; apparently Dr. Pierson viewed them with favour, and had no objection to the policy of profit-making.

The numerous examples which illustrate his theses are drawn, as is natural, mainly from Holland, but other countries are laid under contribution; and in this respect the book is occasionally weak. It is a little curious to find that, when income and property taxes are under discussion, the Prussian state and local income-tax is practically ignored; the importance of local consumption taxes in Prussia is, we think, exaggerated (p. 279); and we doubt if the experience of countries other than Holland bears out the conclusion (p. 272) that specific customs duties are more objectionable than *ad valorem* duties (they are certainly less provocative of fraud). In this connexion we have some grievances against both Mr. Wotzel and M. Suret. In spite of the numerous and important changes in forms and methods of taxation which have taken place since 1902 (the date of the edition which they have utilised)—changes which in some cases, as in that of the British income-tax and estate duties, make Dr. Pierson's illustrations misleading—neither of his translators has revised the author's statements (though Mr. Wotzel has occasionally a note to the effect that the illustration no longer

applies) or brought them down to a later date. We can appreciate the reasons for this inaction, though it diminishes the value of the book as a source of information; but we cannot reconcile ourselves to the absence (in both cases) of any index, or regard Mr. Wotzel's analysis of contents as a satisfactory substitute. The two translators have rendered real service to their respective countrymen; our only regret is that they did not do a little more. P.A.

4.—Other New Publications.*

Brutzer (Gustav). Die Verteuerung der Lebensmittel in Berlin im Laufe der letzten 30 Jahre und ihre Bedeutung für den Berliner Arbeiterhaushalt. 87 pp., 8vo. München: Duncker und Humblot, 1912. Price 3 marks.

[A statistical study of the increased cost of living in Berlin during the past thirty years, and of its influence on the well-being of the working classes.]

Cadbury (Edward). Experiments in Industrial Organisation. With Preface by W. G. Ashley. xxi + 296 pp., 8vo. London: Longmans and Co., 1912. Price 5s. net.

[A detailed account of Messrs. Cadbury's chocolate factory at Bournville, and of the various schemes which they have initiated for the benefit of their employees. The supreme principle of the owners has been the belief that business efficiency and the welfare of the employees are but different sides of the same problem. The sense of social duty of the employers has in no way infringed on the industrial independence of the workpeople, and as Professor Ashley points out in his Preface, the increased fellow feeling among the different classes of workers tends to the smooth running of the factory and to its greater efficiency.]

Collins (E. A.). Leasehold Enfranchisement. The Case for and against and a Practical Scheme. Relief against restrictive covenants in Leases: Scheme for Continuity of Tenure. 117 pp., sm. 8vo. London: P. S. King and Son, 1913. Price 2s. 6d. net.

[The object of the author is "to show the serious effect which the present leasehold system has upon the building trade of the entire country and the many trades which are allied to it, and how it is stultifying the leaseholder, affecting our social system and the general appearance of large areas in all our great cities."]

Einaudi (Luigi). Intorno al Concetto di Reddito Imponibile e di un Sistema d'Imposte sul Reddito Consumato, Saggio di una teoria dell'imposta dedotta esclusivamente dal postulato dell'uguaglianza. viii + 104 pp., fol. Torino: Vincenzo Bona, 1912.

Glutsky (E. E.). Theory of Correlation and Frequency Curves. (In Russian.) 208 pp., 8vo. Kiev, 1912. Price 1 rouble 25 kopecks.

Higginson (John Hedley). Tariffs at work. An outline of practical tariff administration, with special reference to the United States and Canada. xiv + 136 pp., 8vo. London: P. S. King and Son, 1913. Price 2s. net.

[An inquiry into the working of the various tariff systems of different countries. As regards the United States and Canada, the author was able to study their tariff administration on the spot. The inquiry is that of a student, and is of a non-partisan character. The book describes *ad valorem* and specific duties, bonded warehouses and free ports, &c., and in an appendix compares the past and present tariff administration of Great Britain.]

* See also "Additions to the Library," page 538, *sqq.*

Innes (Charles E.). Citizens' Charter. A scheme of National Organisation. 31 pp., 8vo. London, 1913. Price 3*d.*

Knibbs (G. H.). Professional Papers. 1. The International Nosological Classification, &c. 2. Secular Progress of Pulmonary Tuberculosis and Cancer, &c. 3. The Improvement of Infantile Mortality, &c. 4. Secular and Annual Fluctuation of Deaths from Several Diseases. 48 pp., 8vo. Sydney: Commonwealth Bureau of Census and Statistics, 1913.

Lectures on British Commerce, including Finance, Insurance, Business and Industry. xvi + 279 pp., 8vo. London: Sir Isaac Pitman and Sons, Ltd., 1913. Price 7*s.* 6*d.* net.

[This volume consists of ten of the lectures organised by the International Society for the Promotion of Commercial Education, and delivered at the London School of Economics in the summer of 1911. The lecturers cover leading authorities on the subject of their respective addresses, which were primarily intended to describe English trade to foreigners. It is suggested that this may perhaps account for the small attendance of Englishmen at the lectures, which dealt with, among other subjects, the Bank of England, Taxation, the Postal Service, the Port of London, Marine Insurance, British Shipping, Fire, Life and Industrial Assurance, the Coal and the Woollen Industries. An Index would have added to the value of the book.]

March (Lucien). La Fertilité des Mariages suivant la Profession et la Situation Sociale. 20 pp., 8vo. Paris: Masson and Co., 1913.

[A short comparative study of the fertility of marriage according to occupation and social condition, and of the statistical material available for such investigation.]

——— Le Traitement Statistique des Mesures Mentales. 50 pp., 8vo. Paris, 1912.

[A mathematical study of the statistical treatment of mental measurements.]

Michel (E.). Le valeur vénale de la propriété non bâtie en France. (1911.) 9 pp., la. 8vo. Paris: Berger, Levrault and Co., 1911. Price 1 franc.

[A study of the estimated saleable value of landed property not built upon in France at the present time, compared with earlier estimates of a like kind, of which there have been several.]

Mortara (Giorgio). Messina: come vive. 53 pp., 8vo. Rome: Athenæum, 1913.

Moulton (Harold G.). Waterways versus Railways. xviii + 468 pp., 8vo. Boston: Houghton Mifflin Co., 1912. Price \$2 net.

[A study of the comparative cost of water and railway transport in different countries. The general assumption, which the author shared, that traffic of certain kinds can be carried cheaper by water than by rail needs qualification, the author having found that no adequate analysis of the cost of transport by water had been made, and that its cheapness had been tacitly assumed. The general belief in the economic advantages of inland waterways is not borne out as the result of the author's studies, which have led him to the opinion that advocates of waterway development are mistaken in their views.]

Müller (Dr. Ernst). Einführung in die Statistik. vi + 46 pp., 8vo. München, Duncker and Humblot, 1912. Price 1.50 marks.

[A short introductory book on statistics for the use of those wishing to familiarize themselves with the main facts of the science.]

Raper (Charles L.). Railway Transportation: a History of its Economics and of its Relation to the State. ix + 331 pp., 8vo. New York: G. P. Putnam's Sons, 1912. Price 6s. net.

[This book has been written with the intention of bringing up to date Professor Hadley's book on this subject written in 1885. Railway development and State intervention in railway matters have developed to such an extent since that date that a new book was required. The railway systems of the principal European countries and the United States are described, and there is also a chapter on the State ownership and working of railways where such exist.]

Ripley (William Z.). Railroads: Rates and Regulations. xviii + 659 pp., 8vo. London: Longmans, Green and Co., 1913. Price 14s. net.

[This book is the outcome of the author's continuous interest in American railways since 1887 when the Interstate Commerce Commission came into being. His varied experiences, extending over many years, have convinced him that the subjection of railway transport to State control was a primary need of the time. He has endeavoured to treat his subject impartially and with due fairness to the three great parties concerned, namely, the owners, the shippers, and the people. In a second volume which the author hopes to issue this year, matters of finance and corporate relations will be dealt with. In his opinion, the development of inter-railway relations, next to State control, is the most striking phenomenon of the last decade.]

Seligman (Edwin R. A.). L'Impôt sur le Revenu. Traduction française par W. Oualid. xii + 842 pp., 8vo. Paris: Giard and Brière, 1913. Price 15 francs.

[A translation of Prof. Seligman's well-known book on the Income Tax, a review of which appeared in the *Journal* for December, 1911.]

Stevens (William S.). Industrial Combinations and Trusts. xiv + 593 pp., 8vo. New York: The Macmillan Co., 1913. Price 8s. 6d. net.

[The editor of the present volume has been impressed by the need of an impartial book on this subject. In its preparation two purposes have been kept steadily in view. The first was to design a volume which would place within reach of students, material much of which is difficult of access or altogether unavailable, and the second purpose was the collection of material which would give to the ordinary reader a fair knowledge at first hand of the historical development of the Trust movement in the United States, and a thorough comprehension of those problems in regard to them that the country has to face to-day.]

Tenerelli (F. G.). Le Finanze Comunali. 450 pp., 8vo. Milano: Società Editrice Libreria, 1913. Price 12 lire.

[A general economic and statistical study of the principal towns of Italy, as regards their finances and other municipal activities. The book is divided into four parts, each of which is subdivided into chapters. The first deals with the relation of receipts to expenditure and how they are balanced. The second part deals with municipal expenditure under its different heads, the third with receipts and how obtained, and the fourth with financial statements of the different towns and comparative statistical tables for a series of years.]

Withers (Hartley). Money-Changing. An introduction to foreign exchange. viii + 183 pp., 8vo. London: Smith, Elder and Co., 1913. Price 5s. net.

[This book contains the substance of a series of lectures delivered by the author to members of the Institute of Bankers. It is divided into nine chapters, each dealing with some phase of the question, and while not claiming to cover all the technical details of foreign exchange, it gives a clear and readable explanation of what foreign exchange really means.]

Wood (Frederick A.). The Finances of Vermont. Columbia University Studies. Vol. 52, No. 3. 147 pp., 8vo. New York: Columbia University, 1913. Price 4s.

[This volume is to a certain extent supplemental to an earlier study by the author, issued in 1894. It was only possible in that volume to deal with the subject of revenue, but a presentation of the other aspects of the financial history of the State were, in the author's opinion, worth giving, hence the present volume.]

Russian Year-Book for 1913. xx+809 pp., 8vo. London: Eyre and Spottiswoode, Ltd., 1913. Price 10s. 6d. net.

[A useful compilation of general and statistical information dealing with the Russian Empire. The book is divided into some thirty sections descriptive of the administration, production, consumption, and economic movement of the country generally, and such recent statistics as are available on these subjects are included.]

United States. Proceedings of the Sixth Annual Meeting of the Association of Life Insurance Presidents. 146 pp., 8vo. New York, 1912.

[Contains an account of the proceedings and of the Papers read at the meeting. Among these may be mentioned "The effect of safe water supplies on the typhoid fever rate," by Dr. A. J. McLaughlin, and "The influence of vital statistics on longevity," by Dr. W. S. Rankin.]

——— *Massachusetts.* Report of the Commission on Compensation for Industrial Accidents. 322 pp., 8vo. Boston: Wright and Potter Printing Co., 1912.

[The Commission was appointed to consider what change should be made in the present system of paying compensation to employees for injuries received in industrial accidents, and to select the best method for carrying out this purpose and to draft the necessary legislation to give it effect. The report contains an account of the proceedings of the Commission and gives a short description of the laws in force in other countries with regard to compensation for industrial accidents.]

CORRESPONDENCE.

STILL-BIRTHS IN RELATION TO INFANTILE MORTALITY.

To the Editors of the "Journal of the Royal Statistical Society."

SIRS,—In Dr. Dudfield's interesting paper on "Still-births in Relation to Infantile Mortality," with which he opened the discussion of the extremely valuable Report of the Special Committee on Infantile Mortality, there appears the following footnote:—¹

"I have been informed quite recently that in certain of the States within the Union (N. America) the deaths of children aged under one week are excluded from the data used in calculating infantile mortality rates. I have not had time to verify that statement, but I have no reason to doubt the accuracy of my informant."

In the discussion following, Sir Athelstane Baines very properly remarked that "Our country was undoubtedly at a disadvantage on this point [the registration of still-births], but he did not think that Dr. Dudfield was handicapped more heavily than France, Holland, and the United States, as to which last the footnote to the paper conveyed information regarding the basis of calculation of infantile mortality which astounded him."

Dr. Dudfield's informant was entirely mistaken. No State of the Union now excludes, nor, so far as I have been able to ascertain by special inquiry, has ever excluded, deaths of infants under one week of age. In a few city reports, *e.g.*, those of Minneapolis and New York, deaths of infants under one week of age were excluded from certain tables, but the practice has now been discontinued. In two State reports premature births have been excluded from deaths (New Hampshire), or from the tables of infantile mortality, although included in the general tables relating to deaths (Maine). Premature births have also been excluded in the reports of certain cities.

The Rules of Statistical Practice of the American Public Health Association are prescribed in the instructions under which all returns of deaths are made to the Bureau of the Census:—

Still-births (as related to deaths).

Rule No. 4.—Still-borns should not be included in deaths.

Rule No. 5.—Children born alive and *living for any time whatever*, no matter how brief, after birth, should not be classed as still-births, even though reported by the attending physicians or midwives as "still-born."

Rule No. 6.—Whenever age, in days, hours, or minutes, is reported for a "still-born" child, or indicated by a difference between dates of birth and death, the registrar should secure a statement that will enable the case to be classed with certainty either as a still-birth or as a death. If no additional information can be obtained, the

¹ *Journal of the Royal Statistical Society*, December, 1912, p. 3.

statement of age should govern, and the case be compiled as a death, not as a still-birth.

Premature births.

Rule No. 7.—Premature births (not still-born) should be included in total deaths (classified under International Title No. 151).

Rule No. 8.—Premature births (still-born) should be classed under still-births, and should not be included in total deaths.

Rule No. 9.—When a premature birth is reported as “still-born” and an inconsistent statement of age (days, hours, minutes) is also given, the registrar should endeavour to secure a statement that will enable a case to be classed with certainty either as a still-birth or as a death. If no additional information can be obtained, the statement of age should govern, and the case be compiled as a death, not as a still-birth.

Rule No. 10.—When a premature birth is reported with no statement of age (space left blank), the local registrar should endeavour to obtain a statement of age, or at least that the child was born alive; but, in the absence of any further data, the case should be compiled as a still-birth.

The Mortality Statistics of the Census, based upon returns made in accordance with these Rules, contain all deaths of children born alive, including those of children prematurely born.²

The great difficulty in the United States with respect to the presentation of proper rates of infantile mortality lies not in the exclusion of deaths under a certain age limit, but in the fact that many States do not possess even approximately complete registration of deaths and even more States do not have fairly complete registration of births. Hence few States attempt to present rates of infantile mortality at all. This condition we are of course endeavouring to remedy by advocating the passage and enforcement of adequate laws by the States. The registration area for deaths increased from 40·5 per cent. of the total population in 1900 to 63·1 per cent. in 1911. The area of effective birth registration is also increasing. The time when registration of vital statistics for the entire country shall be complete is not yet in sight, but in the meantime the requirements for the inclusion of all deaths and for the proper statement of infantile mortality will be strictly enforced in the statistics published by the Bureau of the Census and in State and city reports, so far as the laws in force supply the requisite data.

I am, Sirs, &c.,

CRESSY L. WILBUR, M.D.,

Chief Statistician, Bureau of the Census.

Washington, D.C., March 21, 1913.

The above letter has been communicated to Dr. Dudfield, who sends the following note :—

I cannot do less than accept Dr. Wilbur's correction, but I should like to point out that in reading the Paper I emphasized

² A few exceptions due to disregard of the instructions in the returns made for certain cities are noted in the Bulletin of Mortality Statistics, 1911, now in press.

the fact that I made the statement with all reservation, and that, for the reason that I had not been able to verify the statement, I had put it in a footnote instead of incorporating it in the text of my Paper.

It may not be out of place to observe that Professor Wesley Mitchell's contribution to the discussion was understood by me, and possibly others, to confirm the statement made in the footnote. Moreover, I observe from Dr. Wilbur's letter that the practice described had some vogue in some of the larger cities of the United States, *e.g.*, New York. I have no doubt that it was on the reading of reports from one or other of such cities that my informant based his statement.

CURRENT NOTES.

The trade returns again show an increase in the value of both imports and exports. The subjoined tables compare the returns of the twelve months ending March, 1913, with the twelve months ending March, 1912.

[000's omitted.]

Imports.	Twelve months ending March, 1913.	Twelve months ending March, 1912.	Increase (+).
Imports, value c.i.f.—	£	£	£
I. Food, drink and tobacco	282,057,	264,590,	+ 17,467,
II. Raw materials and articles mainly unmanufactured	273,872,	249,340,	+ 24,532,
III. Articles wholly or mainly manufactured	186,228,	166,341,	+ 19,887,
IV. Miscellaneous and unclassified (including parcel post)	2,920,	2,514,	+ 406,
Total merchandise	745,077,	682,785,	+ 62,292,
Imports of bullion and specie	69,680,	61,057,	+ 8,623,

[000's omitted.]

Exports.	Twelve months ending March, 1913.	Twelve months ending March, 1912.	Increase (+).
Exports of produce and manu- factures of the United Kingdom, value f.o.b.—	£	£	£
I. Food, drink and tobacco	32,106,	29,588,	+ 2,518,
II. Raw materials and articles mainly unmanufactured	62,068,	51,798,	+ 10,270,
III. Articles wholly or mainly manufactured	384,128,	363,224,	+ 20,904,
IV. Miscellaneous and unclassified (including parcel post)	10,108,	9,359,	+ 749,
Exports of foreign and colonial merchandise, value f.o.b.—			
I. Food, drink and tobacco	14,881,	14,632,	+ 249,
II. Raw materials and articles mainly unmanufactured	66,762,	61,214,	+ 5,548,
III. Articles wholly or mainly manufactured	28,798,	28,454,	+ 344,
IV. Miscellaneous and unclassified (including parcel post)	163,	151,	+ 12,
Total, British, foreign and colonial	599,014,	558,420,	+ 40,594,
Exports of bullion and specie	63,567,	58,838,	+ 4,729,

[000's omitted.]

Shipping.	Twelve months ending March, 1913.	Twelve months ending March, 1912.	Increase (+).
	Tons.	Tons.	Tons.
Total, British and foreign, <i>entered</i> } with cargoes	46,865,	41,980,	+ 4,885,
Total, British and foreign, <i>cleared</i> } with cargoes	64,459,	56,972,	+ 7,487,

According to the Board of Trade *Labour Gazette*, the state of the labour market in February was as follows:—

	Trade unions making returns. Net membership.	Reported as unemployed.	
		Number.	Percentage.
February, 1913	903,503	17,835	2·0
January, 1913	884,444	19,498	2·2
February, 1912	829,695	23,611	2·8

Mr. Sauerbeck's index-number for March, as given in the *Statist*, is 86·7, as against 86·1 in February, the average of the eleven years 1867-77 being taken as 100. There was a distinct recovery in the prices of commodities, which was, however, confined to a few articles: beef, mutton, bacon and sugar among foodstuffs; iron and copper among metals; and cotton, flax, leather and petroleum among materials. On the other hand, barley, oats, flour, coffee, olive oil and seeds were cheaper. The aggregate result is that with the exception of vegetable food there was a general recovery in prices during the month, and that while food was slightly cheaper materials were distinctly dearer. Articles of food were 79·2 as compared with 79·4 in February, and materials 92·1 as compared with 90·9. The *Economist* index-number is 2,717, the same as for February.

Employment continued good generally in February. There was an improvement in the printing, building, woodworking and brick-making trades, but in the iron and steel and tin-plate industries there was a decline. It is reported by the Labour Exchanges that there was a continuance of the large demand for workmen in the shipbuilding and engineering trades. There was also a demand for workmen in the Leeds clothing trade. In the case of women, the demand exceeded the supply in the cotton, woollen and worsted trades and in laundry work, and in some districts in the boot, shoe and clothing trades. The percentage of "insured" workpeople unemployed fell from 5·0 at the end of January to 4·4 at the end

of February. The upward movement in wages continued. Compared with a year ago, nearly all the principal industries showed an improvement which was most marked in the iron and steel, engineering, printing, pottery and brick trades.

The death of Dr. John Shaw Billings, which occurred in New York on March 11, at the age of 76, deprives the Society of an Honorary Fellow whose distinguished career was well known on both sides of the Atlantic. Although his connection with the Society was not an intimate one, he was, nevertheless, a donor to the Library, and he was interested in the Society's work and proceedings. When, in 1883, he became Curator of the Army Medical Museum and Library in Washington, he had already been an Honorary Fellow for two years. He was a member of the International Statistical Institute.

Another loss is that of Mr. E. G. Ravenstein, Ph.D., who was elected a Fellow of the Society in 1874. He served on the Council from 1875 to 1879, and again in 1884-85 and 1888-92. On four occasions Mr. Ravenstein read Papers before the Society, viz., "Statistics of the Paris Geographical Congress" (JOURNAL, vol. xxxviii, 1875); "The Populations of Russia and Turkey" (JOURNAL, vol. xl, 1877); "On the Celtic Languages in the British Isles: a statistical survey" (JOURNAL, vol. xlii, 1879); and, fourthly, "Laws of Migration" (JOURNAL, vol. xlviii and lii, 1885 and 1889). Mr. Ravenstein, like Dr. Billings, was a donor to the Society's library.

It is announced that the office of President of the Austrian Central Statistical Commission, vacated by the death of Dr. Ernst Mischler, is again in charge of Dr. Robert Meyer, who was Dr. Mischler's predecessor.

It is announced by the Société d'Economie politique of Paris that, in consequence of the small number of manuscripts submitted, it has been decided to extend the time allowed for the submission of essays for the "Prix Mercet," as well as to make a change in the subject, which will be "The evolution of protectionist ideas since 1815." The prize consists of a gold medal, of the value of about 12*l.*, and a balance in cash of about 40*l.* The award will be made early in 1915. Essays, which must be in French, and accompanied by a motto and by a sealed envelope repeating the motto and containing the name and address of the author, should be sent to M. Daniel Bellet, Secrétaire Perpetuel de la Société d'Economie politique, à Maisons-Lafitte, Paris, before December 31, 1914.

By order of the United States Senate a series of charts and tables by Mr. Truman G. Palmer, showing the influence of sugar-beet culture on agriculture, and its importance in relation to national economics, has been published under the title of "Sugar at a Glance." The author states that in the preparation of the charts and tables the official figures of the various nations to which they relate have been used as a basis wherever Government figures were available. When Government figures were not available, the figures of European and American statisticians and statistical societies of established repute have been used wherever possible. Where these sources do not cover the point the charts are based on data gathered on various study trips through the beet fields and sugar factories of the United States and those of the large and small European sugar-producing countries, and from personal contact with agricultural economists.

A voluminous report has been received from the Central Statistical Office of the Kingdom of Hungary, entitled "The activity of the Central Statistical Office of the Kingdom of Hungary in the years 1871-1911." This work, which is the thirty-sixth volume of the new series of "Hungarian Statistical Publications," was compiled to celebrate the fortieth anniversary of the Central Statistical Office, and is issued in Hungarian, German and French. Apart from historical material there is much information as to the system of collecting and preparing the statistical data of the office. The final chapter contains a systematic enumeration of reports published since 1868 by the Central Bureau. The large number of these publications, and the variety of subjects treated in them, gives some indication of the activity and versatility of the Department.

The first number of a new journal of economics, entitled *Weltwirtschaftliches Archiv: Zeitschrift für allgemeine und spezielle Weltwirtschaftslehre*, has been issued by Messrs. Gustav Fischer, of Jena. The journal is under the direction of Professor Bernhard Harms, of the University of Kiel, who contributes an introductory article.

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

Accountants' Magazine. April, 1913—Counting by electricity. Modern aspects of the wage problem: *Lightbody* (H. M.). Railway accounts and audit: *Rintoul* (Peter).

Bankers' Magazine. 1913—

March—Dear food, cheap consols and labour unrest. (Continued in next issue April, 1913): *Packer* (C. E.). Credit and trade in the United States and Canada.

April—Progress of banking in Great Britain and Ireland during 1912. No. 3.—Balance sheets of banks in the United Kingdom.

Biometrika. Vol. IX. Parts I and II. *March*, 1913—On the probable errors of frequency constants. Part II. The relationship between the weight of the seed planted and the characteristics of the plant produced: *Harris* (J. A.). On the probable error of a coefficient of correlation as found from a fourfold table: *Pearson* (Karl). Multiple cases of disease in the same house: *Pearson* (Karl). A study of the variations in the female pelvis, based on observations made on 217 specimens of the American Indian squaw: *Emmons* (Arthur B.). The intensity of natural selection in man: *Snow* (E. C.). On errors of random sampling in certain cases not suitable for the application of a "normal" curve of frequency: *Greenwood* (M., Junr.). On the probable error of the correlation coefficient to a second approximation: *Soper* (H. E.). On the measurement of the influence of "Broad Categories" on correlation: *Pearson* (Karl). Bibliography of current literature, biometry and eugenics, Nos. 1—362. On theories of association: *Pearson* (Karl) and *Heron* (David). The correction to be made to the correlation ratio for grouping. By Student. On the hereditary character of general health: *Pearson* (Karl) and *Elderton* (Ethel M.).

Economic Journal. *March*, 1913—The casual labour problem: *Keeling* (Frederick). The interdependence of different sources of demand and supply: *Pigou* (Prof. A. C.). The utility of income and progressive taxation: *Chapman* (Prof. S. J.). The social interest in speculation: *Larlington* (F.). The Census of Production: *Bowley* (Prof. A. L.). Wages and the cost of living in South Africa: *Rees* (J. Morgan). The tax experiment in Wisconsin: *Stamp* (J. C.).

Faculty of Actuaries (Transactions). Vol. VI. Part VII. No. 61—Peerage males—statistics of mortality, first marriage and issue: *Hunter* (Robert Marshall).

UNITED KINGDOM—*Contd.**Financial Review of Reviews—*

November, 1912—Our National financial fallacies. The Balkan belligerents and British investors.

December, 1912—Local taxation finance—some suggested reforms: *Watt* (Henry A.) and *Hynes* (T.).

January, 1913—Wages and profits: *Good* (T.).

February, 1913—The official discouragement of the railway investor: *Lawson* (W. R.) Some puzzles and lessons of the census of production.

March, 1913—London county finance and municipal reform: *Dunmore* (Rt. Hon. The Earl of). London on business lines: *Benn* (Sir John).

April, 1913—Industrial unrest and suggested remedies: *Fithian* (Sir Edward). Our increasing national expenditure.

Journal of the Institute of Bankers. *April, 1913*—Clearing house returns of the United States.

Proceedings of the Royal Society of Edinburgh. Vol. 32. Part 5.—On inheritance of hair and eye colour: *Brownlee* (Dr. John).

Public Health. *April, 1913*—Infantile mortality and the health of survivors in elementary schools: *Parker* (W. G.).

Women's Industrial News. *April, 1913*—The tea-shop girl: *Drake* (Barbara)

UNITED STATES—

American Journal of Sociology. *March, 1913*—The need of social statistics as an aid to the courts: *Willcox* (W. F.) The background of economic theories: *Patten* (Simon N.).

Bankers' Magazine. *March, 1913*—Historical sketch of national banking. The progress and present position of the national banking system: *Murray* (Hon. L. O.). Fifty years of the national banking system: *Conant* (Chas. A.). Financial and banking reform: *Fowler* (Hon. C. N.). The World's best banking system: *Franc* (A. J.). Foreign estimates of American banking: *Lawson* (W. R.). The American Bankers' Association and currency reform: *Farnsworth* (F. E.). Development of savings banks in the United States.

Yale Review (New Series). *April, 1913*—Shakespeare as an economist: *Farnham* (Henry H.).

AUSTRIA—

Statistische Monatschrift. *January, 1913*—Über die theoretischen Grundlagen der Kriminalstatistik mit Schlussfolgerungen für ihre künftige Neugestaltung: *Forcher* (Dr. Hugo). Die Ergebnisse der Volkszählung in Bosnien und der Herzegowina vom 10 Oktober, 1910: *Küttelwascher* (Dr. Hans).

DENMARK—

Nationaløkonomisk-Tidsskrift. *January-February, 1913*—Om raceforbedring: *Hansen* (Søren). Lovgivningen om Banker og sparekasser: *Warming* (Jens). Telegrafens stilling i indenlandsk samkvem: *Gredsted* (M.).

EGYPT—

L'Égypte Contemporaine. March, 1913—Chronique financière de l'Égypte, 1912: *Mounier (R.)*. Chronique judiciaire de l'Égypte, 1911-12: *Forgeur (A.)*.

FRANCE—

Bulletin de Statistique, Ministère des Finances. February, 1913—La Caisse nationale des retraites pour la vieillesse en 1911. La Caisse nationale d'épargne en 1911. Les opérations de la Banque de France en 1912.

Journal de la Société de Statistique de Paris. March, 1913—Communication sur l'or et la hausse des prix: *Théry (Ed.)*. Rapport du trésorier sur les comptes de l'année 1912, la situation financière et le budget de 1913: *Mutrat (Paul)*. Accroissement de la production minérale et métallurgique du globe en l'espace de trente ans (1861-90): *Keller (Octave)*.

La Réforme Sociale. March 16, 1913—Les prêts sur l'honneur, leur utilité, leur objet, leur efficacité: *Dufourmantelle (Maurice)*. La corporation des maîtres tissutiers ribandiers de Lyon et des lieux circonvoisins: *Garcin (F.)*. Les naissances masculines en France: *Clément (Henry)*. Le mouvement économique et social—Allemagne, Autriche-Hongrie: *Blondel (Georges)*.

Revue d'Economie Politique. March-April, 1913—Quelques remarques sur la rente du sol urbain: *Loria (Achille)*. Considérations sur la main-d'œuvre: *Girault (Arthur)*. Le chemin de fer transafricain. Les conclusions d'une mission d'études: *Legoux (Raymond)*. La loi soudanaise du 9 Juin, 1908, sur l'apprentissage: *Mannier (René)*.

Revue des Sciences Politiques. March-April, 1913—L'armée allemande au printemps de 1913: *Dany (Jacques)*. La chambre des comptes de Prusse et la cour des comptes de l'Empire allemand: *Maré (Victor)*. La nouvelle monnaie portugaise: *Penha-Garcia (Cte. de)*. Les ports de Mannheim: *Egger (Emile)*.

GERMANY—

Archiv für Rassen- und Gesellschaft-Biologie. September-October, 1912—Die Formen des ehelichen Geschlechtsverkehrs: *Weissenberg (Dr. S.)*.

Jahrbücher für Nationalökonomie und Statistik (Conrad's). March 1913—Das neue Privilegium der Oesterreichisch-ungarischen Bank: *Zuckerkundl (Robert)*. Die verheirateten Männer im Deutschen Reiche im Alter von unter 21 Jahren nach der Volkszählung vom 1 Dezember, 1910: *Jaekel (Reinhold)*. Wandlungen und Entwicklungstendenzen in der deutschen Auswanderung: *Monckmeier (W.)*. Die Aufschwung der Fabrikindustrie in Kanada: *Berger (Carl)*. Ueber das Geschlechtsverhältnis bei Zwillingse Geburten: *Herowicz (Kuzimierz)*. Lorenz von Stein und Japan: *Grünfeld (Ernst)*.

GERMANY—*Contd.**Zeitschrift für Sozialwissenschaft.* 1913—

Heft 1—Das Heiratsalter im Deutschen Reich 1901-10. (Continued in March, 1913, issue): *Jaekel (Reinhold)*. Zur Frage der Eliminierung des Wertproblems aus der Geldtheorie: *Hegn (Otto)*.

Heft 3—Bevölkerungszunahme und Säuglingssterblichkeit: *Müller (Dr. E.)*.

Heft 4—Höherentwicklung und Menschenökonomie: *Schallmayer (W.)*. Die Mittel der äusseren Valutapolitik: *Kellenberger (Ed.)*. Die Familienstatistik der Stadt Zürich: *Feld (W.)*.

ITALY—

Giornale degli Economisti e Rivista di Statistica, 1913—

February—Un po di luce sulla distribuzione della proprietà in Sicilia: *Brucoleri (G.)*. Gli odierni aspetti dell' economia agraria: Le combinazioni dei fattori produttivi: *Di Nola (C.)*. Le origini del Banco Giro: *Inclimona (E.)*. L'Ufficio di statistica dell' Istituto Internazionale di Agricoltura: *Ricci (U.)*. Sulla differenza media con ripetizione: *Cantelli (F.)*. La teoria economica del credito: *Del Vecchio (G.)*. L'emigrazione gialla: *Silvestri (M.)*.

March—La teoria del mercato monetario: *Fanno (M.)*. Messina come vive: *Mortara (G.)*. La statistica della disoccupazione e la rilevazione della domanda di lavoro: *Montemartini (G.)*. La produzione mondiale dei cereali: *Agricola*.

La Riforma Sociale. *February-March*, 1913—Verso l'autonomia doganale: *Prato (Giuseppe)*. Sull'assicurazione di stato contro gli incendi nel Ducato di Modena: *Graziani (Augusto)*. Il regime degli spiriti nella nostra legislazione tributaria: *Tiraroni (Gucopo)*. Gli ammonimenti delle variazioni del tasso dell'interesse: *Einandi (Luigi)*. Il mercato del credito ed i prestiti municipali. Di alcune particolari riforme tributarie urgenti: *Geisser (Alberto)*. La reale commissione pei trattati di commercio ed il discorso inaugurale dell'on Nitti: *Einandi (Luigi)*. Come il protezionismo fa sorgere e fa vivere le industrie protette: *Alfieri (A. A.)*.

MONTHLY LIST OF ADDITIONS TO THE LIBRARY.

During the period that has elapsed since March 8, 1913, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

(a) Foreign Countries.

Argentina—

Agricultural and Pastoral Census. Stock-breeding and agriculture in 1908. 3 vols. and maps., Svo. 1909. (The Board of Agriculture and Fisheries.)

Costa Rica—

Resúmenes Estadísticos. Años 1883 a 1910. Demografía, y Comercio. Agricultura, Industria. 2 vols., la Svo. 1912. (The National Statistical Bureau.)

Egypt—

Public Health. Plague in Egypt during 1899 to 1911. 53 pp., 4to. 1912. (The Administration of Public Health.)

France—

Families. Statistique des Familles en 1906. Sm. 4to. 1912. (The General Statistical Bureau.)

Inland Navigation. Statistique de la Navigation intérieure. Recensement de la Batellerie. Année 1912. 4to. 1912. (The Ministry of Public Works.)

Germany—

Labour. Sonderheft zum Reichs-Arbeitsblatte. Die Verbände der Arbeitgeber, Angestellten und Arbeiter im Jahre 1911. Fol. 1913. (Carl Heymanns Verlag.)

Italy—

Milan. Istituto per le Case Popolari od Economiche di Milano. Relazione al Conto Consuntivo per l'esercizio 1911-12. Fol. 1913. (The Institute.)

Mexico—

Censo de 1910. Division territorial de los Estados Unidos Mexicanos. 3 parts. La Svo. 1913. (The Statistical Bureau.)

Portugal—

Agriculture. Statistique agricole. Resúmenes statistiques. 2^e Fase. Svo. 1913. (The Director-General of Statistics.)

Roumania—

Bulletin Statistique de la Roumanie. No. 28-29. Svo. 1913. (Contains Preliminary returns of Census of Dec. 19, 1912.) (The Director-General of Statistics.)

San Salvador—

Dirección General de Estadística y Observatorio Nacional. Anuario de 1911. Svo. 1912. (The Director-General of Statistics.)

Sweden—

Alcoholic Beverages. Accispliktiga Näringar år 1911-12. Svo. 1913. (The Central Statistical Bureau.)

Elections. Allmänna Val. Landstingsmanavalen år 1912. Svo. 1913. (*Id.*)

Labour. Kollektivafatt i Sverige, 1911. Svo. 1913. (*Id.*)

United States—*Columbia University Studies—*

Vol. 48, No. 2. Progress and Uniformity in Child-Labor Legislation. A Study in Statistical Measurement. *William F. Ogburn*. Svo. 1912. (P. S. King and Son.)

Vol. 52, No. 3. The Finances of Vermont. *Frederick A. Wood*. Svo. 1913. (*Id.*)

Insurance Institute of America. Proceedings of Fourth Conference held at Boston, June 11-12, 1912. Svo. 1913. (The Insurance Institute of America.)

(a) Foreign Countries—*Contd.***International—**

Official Report of Visit of Delegation of International Federation of Master Cotton Spinners' and Manufacturers' Associations to Egypt (October-November, 1912) and Report by Secretary on his subsequent visit to the Anglo-Egyptian Sudan (November-December, 1912) . . . also Cotton Growing in Egypt, a re-issue of report by the Secretary on his visit to Egypt in 1911, with some additions. 8vo. 1913. (The Federation.)

(b) India and Colonies.

Australia, Commonwealth of—

Census, 1911. Census Bulletins. No. 15, Families. No. 16, Occupations. No. 17, Occupied Dwellings. Fol. 1913. (The Commonwealth Statistician.)
 Labor and Industrial Branch. Report No. 1. Prices, price indexes, and cost of living in Australia. By G. H. Knibbs, C.M.G. 8vo. 1912. (*Id.*)
 Professional Notes. 1. The International Nosological Classification, &c. 2. Secular Progress of Pulmonary Tuberculosis and Cancer, &c. 3. The Improvement in Infantile Mortality, &c. 4. Secular and Annual Fluctuations of Deaths from Several Diseases. By G. H. Knibbs. 44 pp., 8vo. 1913. (*Id.*)

Canada—

Report of Departmental Commission on official statistics of Canada. 75 pp., 8vo. 1913. (The Canadian Government Office, London.)

Straits Settlements—

Report on Census taken on March 10, 1911. Fol. Singapore, 1911. (The Colonial Office.)

Union of South Africa—

Province of Cape of Good Hope. Ordinances, 1912. Fol. 1912. (The Government Printing and Stationery Office.)

(c) United Kingdom and its several Divisions.

United Kingdom—

Army. Territorial Force and National Reserve. Statistics relating to Strength and Efficiency. (Cd-6616.) 1913. (Purchased.)
 India. Memorandum on India Office Balances. (Cd-6619.) 1913. (*Id.*)
 — (Mint for Gold Coinage). (495.) 1913. (*Id.*)
 Labour. Report to Board of Trade on Industrial Disputes Investigation Act of Canada 1907, by Sir George Askwith, K.C.B., K.C. (Cd-6603.) 1913. (*Id.*)
 National Insurance Act, 1911. Administration of Sanatorium Benefit. (Cd-6625.) 1913. (*Id.*)
 — Medical Benefit under the German Sickness Insurance Legislation. (Cd-6581.) 1913. (*Id.*)

Great Britain—

Board of Agriculture and Fisheries and Board of Education. Seventh Report of Rural Education Conference. (Cd-6571.) 1913. (Purchased.)
 Report to Board of Agriculture and Fisheries of an Enquiry into Agricultural Credit and Agricultural Co-operation in Germany; with some notes on German Live Stock Insurance. By J. R. Cahill. (Cd-6626.) 1913. (The Author.)

England and Wales—

Census of England and Wales, 1911. Vol. 5. Index to Population Tables for England and Wales, in Vols. 1-4 of the Census Report, 1911. [Cd. 6576]. 1913. (The Census Office.)
 London County Council. Conference of Teachers, 1913. Report of Proceedings. Fol. 1913. (The Clerk of the Council.)
 Birmingham. Special Report of Medical Officer of Health on Infant Mortality in Birmingham. June, 1904. 8vo. 1904. (Dr. Dudfield.)
 Sheffield. Special Committee as to Infantile Mortality. Report of Committee to City Council and Reports submitted to and Summary of Evidence given before the Committee. Fol. 1907. (*Id.*)

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GLEANINGS *from the* CENSUS of PRODUCTION REPORT.

By A. W. FLUX, M.A.

[Read before the Royal Statistical Society, April 15, 1913,
Mr. R. H. REW, C.B., Vice-President, in the Chair.]

It is now rather more than six years since Mr. Yule presented to the Society his Paper on "Statistics of Production and the Census of Production Act, 1906," in which he examined the provisions of the addition then recently made to the Statute Book, and the difficulties which were likely to be encountered in its administration. That Paper and the discussion on it may be said to have surveyed the channel which the new Census of Production Office was to navigate and to have established warning beacons at some rocky headlands, and buoys where dangerous shoals were to be encountered. The journey through the channel has now been once completed, and it is fitting that the Society should be asked to consider the results attained, even though the very common view be endorsed that the greatest gain to be derived from the new information as to our national production will accrue as the survey is repeated at recurring intervals. The selection of a quinquennial interval, as determined by the Order of the Board of Trade of October 28, 1911, is in accordance with the general opinion expressed on the occasion of the reading of Mr. Yule's Paper in February, 1907.

It is by no means necessary, however, to await the results of the new Census, to cover the year 1912, or of future Censuses, in order to secure information of importance from the data now available, and I propose to indicate some of the ways in which it is possible to utilise the present material, developing, so far as the time at my disposal will permit, certain points touched in the General Report prefixed to the recently issued blue-book [Cd. 6320], which contains the revised and completed census data.

I may be allowed to give a word in passing to the relation between the Preliminary Tables, in which the more important data were made available to the public as soon as they could be prepared for publication, and the Final Report with its revised Tables. Certain comparisons, between the data published in these two series of tables, have been made to suggest that the preliminary data were in some cases extraordinarily incomplete and misleading. This is a mistake which arises in the main from a failure to observe that, in the earlier parts of the Preliminary Tables, the figures included related in general to factories only, while the completed figures of the Final Report include information relating to workshops as well. In a few cases the trade aggregates are made up of figures for factories and workshops in such proportions that neither set by itself affords a satisfactory indication of the extent of the operations included in the trade as a whole. As soon as the compilation of the workshop data could be carried to a sufficiently complete stage for inclusion in the Preliminary Tables as they were published, any difficulty arising from this source was overcome, and the variations in trade-aggregates as first published and as they appear in the Final Report are relatively slight after that course was available. The preliminary figures which appeared latest, too, had the advantage of having undergone the process of revision rendered possible by the progress of correspondence with the firms making Returns. This correspondence was necessarily a tedious and relatively slow business. In a newly organised office there are no traditions to guide subordinate members of the staff, and many points have to await the decision of the responsible heads of the office, which, when once decided in principle, involve a greatly diminished expenditure of time in their application. This fairly obvious fact—and its necessary consequences—should not be lost sight of. The early issues of the Preliminary Tables, therefore, covered trades the results for which were considered to be of greatest general interest, and this necessitated a grouping which was not in some respects that arising naturally from the affiliation between different trades. In the Final Report the original grouping has consequently undergone revision, and those trades are dealt with together which have natural connections, as far as that principle admits of application under the circumstances.

The Final Report also contains information on various subjects, such as coal consumption, engine-power available, &c., not included in the matters dealt with in the Preliminary Tables. The completion of the tabulation for all trades, further, rendered available the whole of the data relating to the output of various classes of goods, not merely the data relating to their production in the trades in which they are a principal line of output. It was, therefore,

possible to survey the field as a whole, and to bring together such scattered information.

In the discussion by this Society in 1907, the subject of duplication of recorded output took a place of great prominence, and rightly so. The different stages of manufacture at which sometimes one and the same mass of material is handled may be united under a single control, and returned as a unit, or they may be conducted independently, so that the material contributes repeatedly to the aggregate of recorded output. The raw cotton, from which cotton yarn is made, contributes its quota to the value of that yarn, and thus to the material of the weaver, and yet again, as an element in the woven fabric, to the material purchased and used by makers of cotton garments. In each case the articles produced are properly regarded as the physical product of the manufacturer who turns them out, and their value constitutes his value output. But their gross value does not constitute his value product, which consists only of the addition made, in the process of manufacture, to the materials on which that stage of the manufacturing operations is conducted. The value output may be large or small according as the work is conducted on materials of high or of low value, and can be increased or decreased by modifications of the commercial relations between businesses without any change in the nature or efficiency of the technical processes of manufacture. In such an industry as coal-mining, the value product is a very large proportion—over 86 per cent.—of the value output. In such a case as grain-milling, the value output is over ten times the value product, while in the refining of the precious metals the value output is over one hundred times the value product. Comparisons of the figures of gross output, added together for miscellaneous groups of trades, may consequently convey little real information as to the relative position at different times, or the comparative industrial situation in different countries.

It may be added, for completeness, that what has been referred to above as the value product is not the whole of the amount by which the value of goods made exceeds the value of materials used. Part of the value of the machinery used in the productive work, as well as the value of the materials as they are commonly regarded, is really reproduced in the value of the product. It is not possible to make a satisfactory allowance, trade by trade, or firm by firm, for such depreciation of plant, and the difference between the value of the products of manufacture and the value of the materials used up in making those products is treated as the amount of new value created in the manufacturing process. An attempt is made in the General Report, to which I shall refer later, to estimate roughly, for

the aggregate of all industries in the United Kingdom, the approximate amount of this item of depreciation.

It appears that the aggregate of the gross figures of output of the different firms making returns amounted to 1,765 million £, while the sum of the additions to value made at the different stages of production was 712 million £. For the latter the term "net output" is used in the Report. This term has been used by some writers to cover the value of output after eliminating all duplication between different Returns, or what is called the "net value of products" in United States Census Reports. An attempt to express in money the corresponding total for the United Kingdom in 1907 is made in the General Report, and the total arrived at is given as lying between the limits of 1,241 and 1,256 million £, exclusive of duties, or (say) 1,280 to 1,295 million £, inclusive of such duties as are comprised in the total of 1,765 million £ quoted above. (Duties on home-distilled spirits are not included in the total output of the distilleries.) It would appear, therefore, that the figures of total output include duplication to the extent of 470 to 485 million £. The duplication of goods accounts for most of this, while the addition to the value of the duplicated goods between the works at which they are recorded as output and those at which they are recorded as materials for a further process of production makes up the total. The duplication of goods, therefore, may be estimated at about 25 per cent. of the total value of output recorded.

There would be a good deal of convenience, from the practical standpoint, if the value of goods free of duplication could be used to represent the results obtained in each industry. It is not, however, possible to estimate in some industries with sufficient precision the extent of duplication, though for the aggregate of all industries a reasonable approximation has been possible. Much of the discussion which follows is therefore based on the "net output" in the sense in which this term is used in the Report. This has the advantage of dealing with those accretions of value which occur in the course of the productive processes and may therefore be correlated with the numbers engaged in carrying through those processes.

Before touching this part of my subject, however, it is desirable to refer to the inclusion in the Returns of figures compiled on two different bases. The great majority of the Returns give the values of products as disposed of, inclusive of the profit (or taking into account loss) made by the producers. The Returns of Government Departments, Local Government Authorities, Railway, Tramway, Canal, Harbour, Dock, &c., Companies, and the National Telephone Company are, however, based on cost of production, without profit.

In the commercial concerns, the profit, if any, made by the manufacturing departments is, practically, left to be credited to the other operations of the Companies concerned. In the case of the manufacturing activities of Government departments, national or local, the profit, if any, accrues in the shape of smaller tax levies than would otherwise be necessary. The aggregate value of the output thus entered at cost was 71·6 million £, the "net output" being 35·7 million £, and the numbers employed averaged 505,376. To complete the record on a uniform basis, some item equivalent to profit in respect of the work of this half-million people should be added to the record of "net output." The amount of the item is, however, speculative to a rather high degree. The much-debated question of the efficiency of the organisation of government manufacturing operations is involved in about one-half of the "net output" of the 505,376 workpeople concerned. If it is to be assumed that, selling the goods produced in the competitive market, a value could have been secured much higher than the recorded cost, then it would be proper to add the equivalent to the "net output" total. Though the absence of knowledge prevents the inclusion of such "hypothetical" profit in the tabular totals, it may be as well to remember the point, while the "net output" might perhaps be raised to between 720 and 725 million £, to give a rough indication of the possible effect of the presumed omission, in place of the recorded 712 million £.

There is a remarkable range in the average figure given by dividing the net output for any industry by the numbers engaged in that industry. This figure would appear to be so significant that I propose to devote a large part of this paper to developing the indications of the General Report as to the causes of the contrasts shown, so far as the data contained in the Report may serve to throw light on the problem when the details are more closely examined.

It would be more satisfactory, for the purpose which I have now in hand, if the average net output were classified, not trade by trade, but establishment by establishment. Information of this character is not, however, available, and it remains to be determined whether it would throw enough light on matters which it is desirable to know to justify the expense involved in making the tabulations. The examination of the available material made below may elucidate this point. I have, therefore, arranged the various separately grouped trades in the order of their average net output per head (*see Appendix*), and the following table summarises the results :—

Net output and persons employed classified.

Average net output per head in the trade.	Including all returns.		Excluding non-profit returns.	
	Net output. £000.	Number employed.	Net output. £000.	Number employed.
Under 50 <i>l.</i>	1,915,	59,591	955,	32,613
50 <i>l.</i> and under 75 <i>l.</i>	127,269,	1,938,203	97,166,	1,508,327
75 <i>l.</i> „ 100 <i>l.</i>	185,998,	2,192,288	181,428,	2,144,236
100 <i>l.</i> „ 125 <i>l.</i>	148,855,	1,353,491	148,855,	1,353,491
125 <i>l.</i> „ 150 <i>l.</i>	116,564,	915,761	116,495,	915,291
150 <i>l.</i> „ 175 <i>l.</i>	18,128,	115,465	18,128,	115,465
175 <i>l.</i> „ 200 <i>l.</i>	30,564,	164,830	30,564,	164,830
200 <i>l.</i> and over	82,842,	244,541	82,842,	244,541
Total	712,135,	6,984,170	676,433,	6,478,794

The position of various trades in the table is influenced by the degree in which they were affected by the generally prosperous condition of business in 1907. In some cases an exceptional demand for their products has had the effect of raising the net output considerably above its normal level, while there are not wanting illustrations of depression below the normal level. This point may be borne in mind as supplementing and qualifying some of the comment in the succeeding paragraphs.

The distribution shown is affected by the fact that large industrial totals are treated as units, quite independently of variations which may occur between different localities or groups of establishments. Thus the fourth line of the table, the 100—125*l.* group, includes the Engineering Trades, with an average of 461,703 persons engaged, and the following line includes the Coal Mines, 838,586 persons being employed in and about those mines in 1907, on the average of the days for which returns were received.

Were it possible to break up the Engineering Trades into smaller groups there would probably be some scattering up and down the table of the figures which are massed together in the existing data. The same would hold good of Coal Mines, in view of the considerable variations in the value of the mineral in different localities, and of the number of tons produced per person employed. Other considerable aggregations also exist, the analysis of which would modify the indications of the table in some degree, but it is likely that, were the Iron and Steel Trades in the 100—125*l.* group, the Ship-building Trades, the Building Trades, and the Cotton Trade in the 75—100*l.* group, and the Woollen and Clothing Trades in the 50—75*l.* group broken into subordinate parts, the overlapping of the different processes of decentralisation would go a good way towards neutralizing the effects of all taken together. The material

for doing this is not available in the Report, and thus the experiment cannot be tried. From the data summarised in the table as given, however, we see that, taking the Returns made on a profit basis alone, of the 6,478,794 people engaged in the trades covered by the table, 3,685,176 were engaged in trades in which the average net output per head was below 100*l.*, while 2,793,618 were engaged in trades with a net output over that limit, the average net output per head being about 104*l.* The omission of the non-profit Returns thus raises the average to almost exactly 2*l.* per week per person, the average for the non-profit Returns being barely 71*l.* per head, or under 27*s.* 6*d.* per week per person employed. The median of the Returns on a profit basis is under 90*l.* per head, while the mode appears to be yet lower and might quite probably be in the neighbourhood of 80*l.* if the distribution of the large aggregates above referred to were carried out. It is clear that, in spite of the average net output of 2*l.* per week per head, one-fourth of the persons engaged are in industries not yielding as much as 30*s.* per week per head to meet all the establishment and capital charges, including repairs and depreciation, as well as to provide wages for the employees, interest for the owners of the capital and profits for those who have shouldered the risks of the enterprise.

The two extremities of the table will probably attract most attention. The lower end is readily disposed of. Reference to the detailed tables attached to this paper will show that the group with the lowest net output per head is made up of the Flax Scutching, Fish Curing, and Velvet and Fustian Cutting Trades. In each of the first two of these the work is seasonal, and the figures do not therefore reflect the result of a full year's efforts of those engaged.

At the upper end we have a considerable number of trades the net output for which appears to stand apart from the general grouping revealed by the table. The numbers in the last three groups are rather over half a million, the net output about 130 million £. The general level of the net output of this half-million persons is thus $2\frac{1}{2}$ times as high as the average of the remainder. What are the industries which contrast so strongly with the general conditions?

Taking first the cases in which the net output was recorded as over 200*l.* per head, we find that the group includes the gas, water and electricity undertakings, with 128,161 persons engaged and nearly 32 million £ of net output recorded. As is shown in the Report, the outstanding capital of these undertakings was, roundly, 350 million £. It is easy, therefore, to understand why so large a net output is needed, since, after even a very modest allowance for maintenance, renewal and interest, the balance will be of an order of

magnitude similar to that of the general run of industries. The large capital is, in these cases, needed not for manufacturing purposes only but for the distribution of the product, so that the strictly manufacturing operations, if they could be separated from those connected with distribution, might not present a net output calling for special comment.

Brewing, spirit distilling, and rectifying and compounding of spirits are also included in this group, and, even after making due allowance for the fact that the figure for the first of these is inclusive of duties on the product, the net output per head is very high in all three cases. The necessity for meeting out of the value of the goods as returned considerable charges connected with distribution may probably be a principal cause for the apparent large net output of manufacture. The same general consideration probably accounts for the place of the Ink, Gum and Sealing Wax trades in this group.

Coke works and Shale Oil works also appear in the group, and with regard to these it is probable that the net output of the works in question includes part of what might reasonably be assigned to the Coal and Oil Shale mines, the products of which have been charged at cost in some cases to the works now in question.

The Sugar and Glucose trades also fall within the group, but the deduction of duties would throw them into the group next but one lower. Even so, the net output ranks high. The manufacture of Ice is the only remaining trade yielding a net output of over 200*l.* per head.

The trades with a net output averaging from 150*l.* to 200*l.* per head include almost all those grouped in the Report as Chemical and Allied Trades. The manufacture of cattle, dog and poultry foods has something in common with these trades, and also with grain-milling, the net output for which averages high, 178*l.* per head. The group of trades engaged in the manufacture of farinaceous preparations and household articles for cleansing and polishing (except soap) is another member of the group under consideration, which also includes the manufacture of tobacco and the bottling of liquors. The printing and publishing trades fall into the group in part because the number with which the output is compared does not include the writers not on the permanent staff of the newspapers and magazines from the selling value of which must nevertheless be provided the remuneration of these writers. The true net output per head cannot be ascertained, but it would doubtless be considerably lower than the average of 190*l.* recorded. The special value attaching in some cases to the advertising space in newspapers and magazines helps, however, to keep the figure high.

The enumeration of the trades in the group is completed with the mention of manufactured fuel production, iron-mining, and the refining of the precious metals. Reasons already named in reference to coke works may suffice to explain the presence of the former in the group, while possibly the inclusion of royalties in the charges to be met from net output suffices to account for the second. I shall not attempt to explain in detail every case, but leave them for consideration by those familiar with the conditions of the several trades. My main purpose has been to examine generally the somewhat anomalous tail of the table, so as to clear the way for some further analysis of its main body. To this I now proceed.

It has appeared that in certain cases a heavy burden of capital necessitated a large net output per head in the industries concerned. To some small extent the generality of the operation of this influence may be tested by examining separately the output in establishments where mechanical power is used and those where no such power is employed. The next table makes this analysis, the Returns on a non-profit basis being excluded.

Net output in factories and workshops compared.

(a.) *Classification by net output in trades as a whole.*

Average net output per head in the trade.	Establishments using power.		Workshops (not using power).	
	Net output. £000.	Number employed.	Net output. £000.	Number employed.
Under 50 <i>l.</i>	209,	7,244	745,	25,369
50 <i>l.</i> and under 75 <i>l.</i>	73,517,	1,132,268	23,649,	376,059
75 <i>l.</i> „ 100 <i>l.</i> ..	152,541,	1,763,053	28,887,	381,183
100 <i>l.</i> „ 125 <i>l.</i>	140,064,	1,248,110	8,791,	105,381
125 <i>l.</i> „ 150 <i>l.</i>	115,689,	905,243	806,	10,043
150 <i>l.</i> „ 175 <i>l.</i>	17,124,	104,912	1,005,	10,553
175 <i>l.</i> „ 200 <i>l.</i>	29,726,	160,586	838,	4,244
200 <i>l.</i> and over	79,933,	232,661	2,909,	11,880
Total	608,803,	5,554,082	67,630,	924,712

It is obvious that the workshop output per head falls below that of the factory, taken in the mass, and a rearrangement of details is necessary so as to bring together the trades which have outputs of like magnitude per head in factories taken by themselves and in workshops taken by themselves. The next table effects this.

(b.) *Classification by net output of factories and workshops separately.*

Average net output per head.	Establishments using power.		Workshops (not using power).	
	Net output. £000.	Number employed.	Net output. £000.	Number employed.
Under 5 <i>l.</i>	209,	7,244	2,540,	68,676
5 <i>l.</i> and under 7 <i>5l.</i>	69,431,	1,080,716	29,504,	449,194
7 <i>5l.</i> „ 100 <i>l.</i>	156,343,	1,811,932	28,968,	365,472
100 <i>l.</i> „ 12 <i>5l.</i>	137,989,	1,232,267	2,466,	22,336
12 <i>5l.</i> „ 150 <i>l.</i>	116,309,	912,566	481,	3,600
150 <i>l.</i> „ 17 <i>5l.</i>	16,916,	104,996	282,	1,875
17 <i>5l.</i> „ 200 <i>l.</i>	31,673,	171,700	44,	242
200 <i>l.</i> and over	79,933,	232,661	3,345,	13,317
Total	608,803,	5,554,082	67,630,	924,712

The change of basis of classification brings about some concentration of the figures in both parts of the table. The two groups showing large numbers employed in workshops are dominated by the clothing and building trades respectively, and little comment is called for by the distribution of the remaining workshop employees over the table. The movements by which this second table is derived from the preceding one, however, bring to light some apparent anomalies. In general the output per head averages considerably less where no mechanical power is used to assist the human agents in production than in those in which power is more or less generously provided, as is clear from the summary of the table, which shows an average output of 73*l.* per head in the former, compared with nearly 110*l.* in the latter, or, excluding the last three groups of the table, 70*l.* as against 95*l.* The reversal of this relation of inferiority, which is shown in the cases of the clothing trades (65*l.* as against 58*l.*) and in some other instances is sometimes to be attributed to the fact that there are relatively important numbers of outworkers associated with the workshops, while the output per head is calculated with reference to those only who are employed in the workshops, while in other cases the workshops are engaged on special work yielding a larger return than the class of work done in the factories. The chemical trades illustrate the latter situation, the average workshop net output being 219*l.* per head, that of the factories 181*l.*

Though the separation of workshop and factory figures affords some indication of the influence of the charges involved by the maintenance of elaborate machinery, driven by engines whose expenses, other than the cost of fuel, have to be met equally with those of the manual workers from the net output, the variation of net output in factories in different trades remains a striking phenomenon. A different kind of

analysis of the data is needed to bring out the dominant element in the variation shown. For this purpose a table is next shown in which the information for all establishments, factories and workshops together, for which the Returns were made on a profit basis, is arranged so as to show the classification of workers by sex and by the broad age division which separates adults from adolescents. In the Mining groups, the division is usually made at 16 years of age, but in all other trades at 18 years. This consideration vitiates the totals to some extent, but not sufficiently to render them useless or misleading for our purpose.

Classification of persons employed, by sex and age.

Average net output per head in the trade.	Males.		Females.	
	Boys.	Men.	Girls.	Women.
Under 50 <i>l.</i>	901	9,481	1,385	20,846
50 <i>l.</i> and under 75 <i>l.</i>	90,789	511,915	207,548	698,075
75 <i>l.</i> „ 100 <i>l.</i>	215,205	1,337,898	159,627	431,506
100 <i>l.</i> „ 125 <i>l.</i>	165,239	1,055,742	32,742	99,768
125 <i>l.</i> „ 150 <i>l.</i>	65,431	831,132	3,392	15,336
150 <i>l.</i> „ 175 <i>l.</i>	9,854	65,092	13,240	27,279
175 <i>l.</i> „ 200 <i>l.</i>	13,018	138,635	3,038	10,139
200 <i>l.</i> and over	10,172	230,963	366	3,040
Total	570,609	4,180,858	421,338	1,305,989

The relative predominance of female labour in the trades showing the smaller figures of net output is clearly manifest from this grouping of the data. Expressed in percentages we have the following statement, in which is included further information for use shortly :—

Average net output per head.	Males per cent. of all employed.	Females per cent. of all employed.	Horse power of engines at factories per 100 employed	
			In all establishments.	In factories.
Under 50 <i>l.</i>	31·9	68·1	21	92
50 <i>l.</i> and under 75 <i>l.</i>	40·0	60·0	50	67
75 <i>l.</i> „ 100 <i>l.</i>	72·4	27·6	97	118
100 <i>l.</i> „ 125 <i>l.</i>	90·2	9·8	100	189
125 <i>l.</i> „ 150 <i>l.</i>	98·0	2·0	266	269
150 <i>l.</i> „ 175 <i>l.</i>	64·0	36·0	81	89
175 <i>l.</i> „ 200 <i>l.</i>	92·0	8·0	215	221
200 <i>l.</i> and over	98·6	1·4	793	834

The particular examples given in the Report in illustration of the point at issue are thus borne out to the full by the general trend of the aggregate figures. The fact that the trades with net output exceeding about 150*l.* per head of those employed are subject to

conditions separating them from the general mass is even more clearly brought out here than in earlier tables (see pp. 562 and 565).

When we examine the aggregate figures for England and Wales, for Scotland, and for Ireland separately, it is found that the net output per head is highest in the southern division of Great Britain and lowest in Ireland. It is not possible to make a detailed comparison for all trades, because the separation of the figures of output would in some cases afford information as to particular firms in one or other of the countries, and might do so in others. From the obligation imposed by the Census of Production Act to preserve the secrecy of the business of individual firms, it results that we cannot institute a completely comprehensive comparison between the data for the several divisions of the United Kingdom. The trades for which the net output is not available, except for the United Kingdom as a whole, employed 943,105 persons, or rather more than one-seventh of those included in the table showing the sex classification above. They were, however, not equally divided between the sexes, for under one-ninth of the males were included, as compared with nearly a quarter of the females. The particulars which can be shown separately for the geographical divisions, therefore, are not directly comparable with those previously given. It is, consequently, necessary to revise the table of persons employed, eliminating from the previous figures those which cannot be analysed on a geographical basis. The results are summarised below:—

Numbers employed in England and Wales, in Scotland, and in Ireland, so far as they can be separately shown.

Average net output per head.	England and Wales.		Scotland.		Ireland.	
	Number employed.	Per cent. males.	Number employed.	Per cent. males.	Number employed.	Per cent. males.
Under 50 <i>l.</i>	10,582	33·8	20,607	24·7	42,720	34·7
50 <i>l.</i> and under 75 <i>l.</i>	1,120,272	38·5	239,316	39·7	126,994	51·3
75 <i>l.</i> „ 100 <i>l.</i>	1,195,825	85·1	198,723	91·0	10,736	58·3
100 <i>l.</i> „ 125 <i>l.</i>	1,731,224	95·6	171,120	90·6	15,965	79·7
125 <i>l.</i> „ 150 <i>l.</i>	52,737	87·0	123,237	97·6	11,185	94·6
150 <i>l.</i> „ 175 <i>l.</i>	64,018	74·6	10,792	89·2	164	99·9
175 <i>l.</i> „ 200 <i>l.</i>	142,060	92·2	7,186	97·1	462	99·4
200 <i>l.</i> and over	201,643	98·7	26,910	92·4	11,211	98·0
Total	4,518,361	77·8	797,891	74·9	219,437	55·2

The excluded trades are distinguished in the tables of the Appendix by the use of italic type. It may be noted that it has been possible to include shipbuilding in Scotland in the table, but the importance of the Irish shipbuilding industry, the figures for

which are combined with those for England and Wales, in view of the fact that two firms are well known to dominate the Irish industry, prevents the inclusion of the figures for either branch. In other cases in which Irish figures are included with those for England and Wales, the separate statement has not been sacrificed, as the effect on the aggregate figures is but small. So far as this point goes, the figures for England and Wales are probably somewhat lower in the scale than if there were not this small admixture of Irish figures.

It will be of interest to note that the net outputs corresponding to the numbers shown in the last table were 490,497,000*l.* for England and Wales, 79,670,000*l.* for Scotland, 18,689,000 for Ireland, or an average of 109*l.*, 100*l.* and 86*l.* per head respectively. The net output of the 943,105 persons who are excluded from this geographical classification was 87,577,000*l.*, or an average of 93*l.* per head, as compared with an average of 106*l.* per head for those included in that classification. As the net output taken as the basis of classification has been that for the particular geographical division, not that for the United Kingdom as a whole, there results a partial redistribution between the several lines of the table. How far the aggregates are affected may be seen by comparing the figures obtained by the exclusion from earlier tabulations of the trades for which the necessary geographical details are not available with the summation of this last table.

All trades available for the geographical comparison.

Average net output per head.	Classified on United Kingdom output.		Classified as in the preceding table.	
	Number employed.	Per cent. males.	Number employed.	Per cent. males.
Under 50 <i>l.</i>	32,613	31·9	73,909	31·8
50 <i>l.</i> and under 75 <i>l.</i>	1,491,943	39·5	1,486,582	39·8
75 <i>l.</i> „ 100 <i>l.</i>	1,430,987	83·9	1,405,284	85·7
100 <i>l.</i> „ 125 <i>l.</i>	1,223,591	91·4	1,518,309	94·1
125 <i>l.</i> „ 150 <i>l.</i>	900,472	97·9	187,159	94·4
150 <i>l.</i> „ 175 <i>l.</i>	51,427	81·2	74,974	76·8
175 <i>l.</i> „ 200 <i>l.</i>	164,830	92·0	149,708	92·5
200 <i>l.</i> and over	239,826	98·6	239,764	98·0
Total	5,535,689	76·5	5,535,689	76·5

The percentage of female labour in the several groups is thus not seriously affected by the revision of the basis of the classification, except in the 150—175*l.* group, and, in a less degree, in the two groups of next lower grade. It appears, therefore, that in Ireland there is a relatively large proportion of male labour in the 50—75*l.* group, and that group dominates the general position. In Scotland,

the percentage of male labour is somewhat higher than in England for the groups with between 50*l.* and 100*l.* net output per head. Further, the relatively high proportion of female labour in the groups with between 125*l.* and 175*l.* net output per head is a dominantly English phenomenon.

It will be observed that the three groups at the top of the table comprised 51·5 per cent. of the employees in England and Wales, 57·5 per cent. in Scotland, and 82·2 per cent. in Ireland. The left-hand half of the last table shows 53·4 per cent., the right-hand half 53·6 per cent. in these three groups. In the trades which have had to be excluded from these tables, because of the risk of disclosing details affecting individual businesses, 77·4 per cent. of the employees were in these groups.

We see, then, that the relative position of the three divisions of the United Kingdom is not wholly a matter of the presence in certain of these divisions of industries of special character, but is shown in the same industries, and is a phenomenon of much interest and no small importance. Further, the inequalities of the distribution of wealth, of which we hear a good deal, are in some degree paralleled by inequalities in production of wealth. We have not the information needed to show what proportions of the different amounts of net output provide the wages of the operatives, but there can be little doubt that there is a strong link between the magnitude of the net output and the magnitude of the wages paid, at any rate if some exception be made for the higher grades of net output. I will not attempt to discuss which is cause and which effect of the two phenomena named, or whether there is interaction between them, so that each is in turn cause and effect.

The consideration of such figures as have been given above suggest that some interesting results might be secured if there were applied to the detailed figures such a procedure as has been employed in certain investigations of household budgets. It will be recalled that, to determine the relation of means to needs, some writers have computed the equivalent in standard adults—average adult men, that is to say—of families variously composed as to age and sex. If one could similarly compute the net output per head of equivalent adult males, trade by trade, using some reducing factors to apply to the numbers of women, of boys and of girls employed, especially in view of the occurrence of half-timers in certain trades, the relative position, in the tables from which the preceding summaries have been prepared, of many trades might be considerably changed, and the appearance of the tables altered correspondingly. Such attempts to determine the degree of importance of the fact that, in the process of arriving at net output per head, the divisor,

viz., the number employed, is not made up of equivalent units, may be left to the speculatively inclined. It is, of course, impossible to arrange an entirely satisfactory basis for such calculations, for the difference between the different units of the divisor is not merely one of which sufficient account can be taken by a consideration of sex and by distinguishing between juveniles and adults. Even in spite of the fact that only two features commonly connecting differences of productive efficiency are expressed in the available data, speculation as to the possibility of reducing or modifying the apparent contrasts in net output per head might justify a trial of the procedure suggested by the analogy of the family budgets. I pass, however, to another point, namely, the connection between the mechanical assistance given to human labour, and the results of that labour. In the table on p. 567 the average horse-power per person is shown for each of the groups into which the particulars have been classified, and, as might be expected, the magnitude of the net output tends to vary with the power employed, subject to a peculiar break at the point at which irregularity in the progressive relation of female labour to output was found. I leave the figures to speak for themselves, merely noting that the very large figure shown in the highest group is due to the inclusion in that group of the electricity undertakings, which, to a considerable extent, provide motive power for other industries. Were these excluded, the figures of 793 and 834 shown for the highest group would be reduced to 172 and 182 respectively, or less than those shown in the preceding group.

The records of electricity purchased show that about one-third of the electric energy produced by the electricity undertakings was purchased by other establishments making returns to the Census of Production Office. In addition, these establishments produced for themselves somewhat more than double the amount purchased, so that the amount of electricity used for lighting and power in 1907 by productive establishments other than those engaged in the business of electric generation was about equal to the amount generated by these undertakings.

If we examine the records as printed in the Report, we find some striking variations in the degrees in which their generating plant was utilised by firms in different trades. Taking the Board of Trade unit at its nominal relation to the rating of the dynamos, it would appear that the dynamos were used for periods ranging from an average of about one hour per day to an average of twelve hours per day inclusive of Sundays. I have estimated, on the basis of the Returns made (which do not, it may be remarked, cover the whole of the dynamos owned, as Returns were not forthcoming as to the electricity

generated by about 11 per cent. of the total capacity), the capacity of the dynamos which would have been needed, if operated in each trade for the average period shown, to provide the electricity purchased, and find that the engine-power returned would have needed to be increased by about one-half. In this estimate, the electricity supply undertakings are, of course, not included. It further appears that an average of about 1,500 Board of Trade units would, on this basis, be generated per kilowatt of capacity, as compared with about 1,400 units per kilowatt shown by the supply undertakings, and over 1,800 for other establishments. The difference between the 1,500 and the 1,800 arises from the fact that the relative importance of each trade in the one average is in proportion to electricity purchased, in the other to electricity generated.

The engine-record for all industries whose Returns were made on a profit basis showed a total of 10,030,861 horse-power, a total which included engines used as stand-bys, and possibly some which may never be put in action again. Of the total about 25 per cent. would be needed to drive the dynamos recorded, if it be supposed that they were used for that purpose alone. It may be instructive, however, to note that the engines of all establishments other than electric supply undertakings were recorded as having a horse-power of about 8,470,000, and that, of this, about 900,000 horse-power would apparently be needed to operate the dynamos recorded as owned in these establishments. Thus the proportion of the power needed for this work is reduced to below one-ninth in place of the one-fourth which results from including the supply undertakings in the general aggregate. As has been stated above, an important fraction of the output of the supply undertakings is used in the other establishments covered by the record.

Closely connected with the subject of the supply of power is that of coal consumption. In regard to this, as in that of generation of electricity, the Returns secured were not exhaustive. It appears, however, to be possible to compute with some degree of certainty, the total amount of coal used by the establishments making Returns of their output. It may not be precisely true that the coal used varied with the net output, but, in view of the large proportion of the output covered by Returns of coal used which were received, an estimate based on the assumption that the omitted firms used a quantity of coal in similar proportion to net output to that used by firms making Returns will afford a fairly accurate idea of the relative demands for coal by different industries. As particulars of fuel used were not, in general, secured from workshops, the calculation which gives the results set out below has been made on the basis of the

output of the establishments using power alone, except in such cases as blacksmiths' shops or bakehouses, where Returns were received from workshops as well as from other establishments, and where, as will be recognised, fuel consumption is by no means confined to places where mechanical power is generated.

In addition to the coal shown in the table, there was used in blast furnaces in 1907 a total of 21,120,000 tons of coal, and about 15,400,000 tons were carbonised in gas-works.

Estimated coal consumption in industry.

Groups of trades.	Calculated coal consumption. 000 tons.	Horse power of engines at factories. 000 h.p.	Average number employed.	Net output. £000.
Mining and quarrying	18,799,*	2,495,	965,230	119,531,
Iron and steel, shipbuilding } and engineering, &c. }	15,823,	2,089,	1,256,344	131,959,
Other metal trades	1,171,	84,	114,473	11,893,
Textile trades	10,072,	1,988,	1,253,044	94,334,
Clothing trades	835,	85,	754,793	47,568,
Food and drink trades	4,077,	380,	463,536	89,505,
Chemical and allied trades	4,545,	215,	127,842	21,557,
Paper and allied trades	2,177,	238,	325,005	33,582,
Leather and allied trades	596,	55,	84,724	8,618,
Timber trades	650,	174,	239,160	21,442,
Building and allied trades	7,790,	431,	719,608	60,051,
Miscellaneous trades	69,	9,	46,874	4,443,
Public utility services.....	3,658,	1,790,	128,161	31,950,
Total	70,262,	10,033,	6,478,794	676,433,

* Including coke used at coal mines, coke ovens and manufactured fuel works.

As in most of the preceding tables the Returns on a cost basis are excluded also in this calculation. These account for a further 1,000,000 tons of coal used for industrial purposes.

There is shown, on the average, seven tons of coal per horse-power, and eleven tons per person employed, while on the average the net output was about $9\frac{1}{2}l.$ for each ton of coal used. There are wide variations from these average figures, but they may afford a general conception of the relations shown. The more notable variations are due to the inclusion of important amounts of coal used for purposes other than the generation of power, as in brick-making, in the chemical trades and in bakehouses. In the timber trades, coal is supplemented as a fuel by the refuse of sawmills, while some grain mills use wind or water power. It may also be remembered that there has already been given one illustration of a fact which should not be lost sight of, namely, that the recorded engine power is not by any means continuously employed.

The Mining and Metal Trades are seen to account for one-half the computed coal consumption shown in the table, while the Textile and Building Groups are the next largest users and account together for a further quarter of the aggregate shown. If we add in the coal consumption of blast furnaces (21,120,000 tons), the Iron and Steel group will be found to use 40 per cent. of the ninety odd million tons consumed in productive industry.

It should be explained that, except as shown in the footnote to the table, coke consumed has not been brought into the calculation, a proceeding based on the probability that much, if not all, of it was gasworks coke. In the engineering trades, in cement works, in bakehouses and in laundries, the consumption of coke is, however, relatively important, while in gasworks themselves the principal fuel used is coke. In general the relative position of the groups is not affected to an important extent by the omission of the coke, while it would be misleading to treat it as an addition to the total demand of industry on our coal mines.

As the coal raised in 1907 was 266,560,000 tons, and 63,601,000 tons were exported, while 18,619,000 tons were shipped as bunker coal on foreign-going steamers, the industrial consumption above-estimated amounts to approximately one-half of the retained 184,340,000 tons. The gasworks consumption for making gas has been already stated as about 15,400,000 tons; the railways used 12,923,000 tons for locomotive purposes and 2,150,000 tons were shipped as bunkers on coastwise steamers. There remains about 61,500,000 tons for all domestic purposes and for use in mercantile establishments.

In the preceding part of this paper the figures which have been used to represent the numbers employed have throughout been the averages of the numbers returned. For workshops the information supplied was, in general, a figure representing the number ordinarily employed, so that no information as to fluctuations of employment are available in their case. For factories, however, the number at work on the last Wednesday in each of the four months, January, April, July and October was asked for. The resulting figures cannot be taken as affording any measure of the degree of irregularity of employment of individual persons, but they may probably afford some idea of the extent of regularity of employment in the mass. From this point of view, they are really quite remarkable. In most cases, the fluctuation between the date when the smallest trade aggregate of employed was shown and that of the largest figure recorded is not very marked. This may be illustrated from the following summary for groups of trades, in which there is a reversion to the basis of the first figures given in this Paper, that is to say,

the Returns on a cost basis are included. The January figure applies, in a number of cases, to January, 1908.

Variation of employment in 1907.

Group of trades.	Numbers at work in factories on the last Wednesday in			
	January.	April.	July.	October.
Mines and quarries	946,318	963,818	969,793	981,010
Iron and steel group	1,481,270	1,492,950	1,496,744	1,481,540
Other metals	101,610	101,449	101,086	102,774
Textile group	1,221,289	1,223,837	1,227,856	1,232,461
Clothing group	435,215	443,939	440,790	441,415
Food and drink group	365,941	367,416	378,459	377,625
Chemical group	123,346	124,772	120,449	122,057
Paper group	305,971	306,647	304,424	310,127
Leather group	68,244	69,071	68,267	67,422
Timber group	174,557	178,926	178,146	178,814
Building group*	665,944	737,399	741,230	701,072
Miscellaneous	34,438	34,237	34,365	35,475
Public utilities group	331,068	317,895	313,710	324,853
Total	6,255,221	6,362,356	6,375,319	6,356,645

* In this group *all* employees in the Building and Contracting trades are included.

Within the several groups and, indeed, within the individual trades there occur variations which are of importance to those concerned, but are not expressed in the figures summarised in this table. The extreme of variation in the aggregate numbers is shown between January and July, but does not reach two per cent. In individual groups, however, we find considerable variations, notably in the Building group, where the range is nearly 11 per cent., while in the Public Utilities group there is a range of about 6 per cent. compensatory in its effect, so far as it goes, to that in the Building group. The attention of the Society has been drawn by Mr. Popplewell, in a recent Paper, to the relation of individual members of these groups, namely, the gas works and the brickfields. Time will not permit of a detailed examination of all the trades showing large variation, but I may direct the attention of those interested to the information afforded by these data, though the lack of the corresponding figure for the 10 per cent. of the workpeople in workshops not covered by the table may mask the worst of the irregularity of demand for labour. It may be worth while, before passing on, to note that, in the Clothing group and in the Food group we find the next most important ranges of variation. In the former, the workshop data (which are, it may be observed, included in the figures for building) are lacking, and the indications are therefore much reduced in value, apart from the fact that it is in the clothing and building groups that the most important leakages,

from the point of view of the universality of the Returns, are believed to have occurred. The expansion of 2 per cent. in the numbers employed between January and April is, however, significant of known fluctuations in the clothing trades, and the recession in July is partly masked in the table by the continued expansion of the laundry trades in the summer.

The expansion of $3\frac{1}{2}$ per cent. in the numbers employed in the Food and Drink group between January and July is also significant of familiar changes. The Cocoa, Confectionery and Fruit Preserving Trade expanded, while Brewing and Distilling fell off in the interval, leaving but a small balance of expansion. The Aerated Water Trade and the trades grouped with it (Cider, British-made Wines, Non-Alcoholic Beverages (brewed) and Vinegar) show, however, the expansion which determines the group movement, the July figure being 26 per cent. greater than that for January. There are a number of other interesting features in the details of these employment figures, but this paper is already too long, and I must pass to my final topic, namely, the use made of the data afforded by the Census of Production to build up an estimate of the National Income.

The relation of the Census of Production data to the question of national income is obvious, since, viewed from the standpoint of goods, the consumption of the nation must be deducible from the production and the external trade, while the income of the individuals composing the nation is exchanged for these goods and for services of an immaterial nature. If a reasonable estimate of these immaterial services can be made, the record of goods completes the information needed. Saving is here included with consumption, since it has its concrete expression in the acquisition of goods, or claims to goods, the consumption of which takes place in the process of further production, or which are consumed slowly as they give off the services which they are adapted to render.

The goods consumed, however, when regarded as the exchange equivalent of income, are valued after passing through the hands of merchants, wholesale and retail, processes of adaptation for use after acquisition by the consumer not being valued, as one does not set a value on the work done by oneself in preparing, for example, food for eating. A line has to be drawn somewhere, and the most easily-defined line is drawn when the last process of exchange before consumption takes place is reached.

We need, then, three pieces of information, namely :

- (a) The value of the goods as they leave the hands of producers.
- (b) The value added in the processes of trade and transport.
- (c) The value of services (other than those involved in the production and distribution of material goods) rendered for money or its equivalent.

The first of these is deducible with more or less precision from the data provided by the Census of Production, the other two must, in the present state of our knowledge, be the subject of estimate. The first is, however, considerably the most important of the three. The figure needed is that which relates to the aggregate value of the goods produced after elimination of all duplicate entries; to give clearness to the idea, one may call it the value of the output as it might be summed up if, without altering the technical processes, or the aggregate amount of profits, the entire field of production were owned by one vast corporation, so that the passage of partly manufactured goods from one stage to another would be a matter of internal bookkeeping and would not affect the figures expressing final results of manufacture. For the industries covered by the Returns to the Census of Production Office this figure has been estimated, as stated at the outset of this paper, at 1,280 to 1,295 million £ inclusive of duties on all dutiable goods except spirits. The uncertainty in the figure arises from uncertainty in the amount to be allowed for charges of merchandising and transport of partly manufactured goods as they pass from establishment to establishment. The make-up of the figure is simple, for the net output, known from the Returns (to which an estimated addition of 50,000,000*l.* is made in respect of omissions in cases where Returns were not procurable) is added to the cost of materials obtained from sources outside the field of enumeration, and an allowance for the charges just referred to completes the calculation. The estimate of the value of the materials is based partly on the information obtained by the Agricultural Departments of Great Britain and Ireland, supplemented by that afforded in Mr. Rew's paper on "The Nation's Food Supply," printed in the *Journal* for December last, and partly on the statistics of foreign trade. Estimates of the amount of duplication occurring between the agricultural (and fisheries) totals and the manufacturing totals are necessary, and a further item which is based on estimates made in the Census Office is the value of industrial materials derived, not from extractive industries, but from the refuse of consumption. The amount of this last item is so small, relatively, that a considerable error in the estimate will not seriously affect the resulting aggregates. The result of the processes just described, covering the output of both agriculture and manufacture, and taking imports and exports into consideration, is to give a value of 1,235 to 1,270 million £ as representing the value of goods available for consumption in the United Kingdom in 1907, taken at the factory or port, and inclusive of duties of customs or excise.

The second of the items of information required was only

capable of comparatively rough estimate, and, though inquiries made sufficed to enable such an estimate to be framed, those inquiries cannot pretend to anything like exhaustiveness. They result in assigning a sum estimated as lying between 428 and 563 million £ for trading and transport charges between factory or port and consumer. So far as the numbers of those whose livelihood is derived from these departments of our national life can be judged from reports of past censuses of population, the values per head produced by their efforts do not, on the average, differ very widely from those discussed earlier as resulting from manufacturing operations. This point will be able to be more effectively tested when the detailed reports of the population census of 1911 become available.

The third of the items of information needed was again capable only of rough estimate. I do not propose this evening to enter into the details of the estimate, but, to complete the statement, will merely cite the aggregate result of estimating the various items making up the total of services exchanged for material goods or for other services. It is, as a matter of fact, not separately stated, being made up of a figure of 350 to 400 million £ and that part of the total estimated savings of 320 to 350 million £ which was contributed by the class whose income is in question.

This estimate of savings is the result of a calculation, partly based on data contained in the Census of Production Returns, partly on outside data. From the Census of Production Returns it is possible to select from the mass of final products all those whose nature shows that they are intended as production goods, not as consumption goods, to use a phraseology familiar in certain economic treatises. These production goods are, however, not available as increases to the capital equipment of the community until provision has been made for making good the effects of wear and tear, so that capital equipment is physically maintained. The available 350 to 360 million £ must be diminished in proportion to the needs for this purpose, but those needs are partly unknown, and some estimate of their amount was therefore essential.

We are thus face to face with the problem of valuing the capital equipment of industry, while the data for the purpose are sadly inadequate. On the principle that a rough estimate is better than none for the purpose in hand, an attempt was made to provide such an approximate figure. For some part of the total there were data of a usable kind, namely for gas, water and electricity supply, while for mining it was believed that a basis of estimate frequently used by some who may be regarded as experts would suffice for the purpose. It was, further, found that in such cases as the cotton trade and iron and steel works, either accepted estimates or the

recorded capital of Joint Stock Companies bore a relation to the net output sufficiently similar to the corresponding relation shown in United States Census records to provide encouragement in using these latter records as a guide to the general situation in this country. The fact that manufacturing industry is in an advanced stage in the United States appeared to remove some objections to applying another country's figures to our own situation, while the fact that it was not the money value of the capital, but the relation of that money value to another money value, namely, the value addition resulting from industrial processes, which was taken as a guide diminishes the force of another objection. The final result was not out of accord with the other information available, so that it has been used for the purposes of the estimate of depreciation required in the stage of our calculation now under discussion. The capital of the establishments covered by the returns to the Census of Production Office is, then, roughly estimated as lying between 1,400,000,000*l.* and 1,600,000,000*l.* Careful consideration of the proportion of the total probably representing buildings and plant in different groups of industries results in an average figure of somewhat under two-thirds, so that about 1,000,000,000*l.* of capital need to be provided with a wear and tear allowance.

I think that one may summarise the impression produced by company reports and company chairmen's speeches fairly in the statement that depreciation is, in practice, provided for on a scale depending on the funds available for distribution in the particular year. It may also be calculated by reference to the nature of the different classes of plant to be depreciated, using recognised or conventional rates for the several classes. The latter more nearly corresponds to the conception of the requirements of the case expressed in the calculations of the General Report; but it may not be improper to recall that, as we are considering the application of a complex of goods forthcoming in response to the demands of the actual situation, the former mode of treating the matter may not be entirely foreign to the case before us, especially in view of the fact that 1907 was, in many trades, a year of great prosperity, and consequently of exceptional opportunities for making, from that year's results, more than ordinary provision for the maintenance and replacement of plant.

The estimate made of the requirements for these purposes in the industries covered by the Census is from 75 to 85 million £, of which 10 million £ was provided in materials used by the repairing staffs of manufacturing firms and included in the aggregate cost of materials returned to the Census of Production Office, the remainder being chargeable on net output. In consideration of the magnitude

of the sum in question, in relation on the one hand to the net output of the industries concerned, on the other to the value of capital goods produced in the year, it would appear that the mode of estimating the aggregate manufacturing capital cannot be fundamentally wrong. Taking, further, into account corresponding needs for maintenance of the remainder of the capital of the United Kingdom, there results an estimated requirement for maintenance and renewals of about one-half the capital goods available.

The data for completing the estimate for national income have now been passed under review, with the exception of (*a*) additions to consumption capital, for which the data of the Census afford a rough guide; (*b*) the addition to investments abroad, whether these investments consist in the equipment of establishments abroad with machinery, &c., of our own production, or of the acquisition, in exchange for other of our exports or for claims otherwise arising, of the ownership of property abroad. The compilations of writers who make a regular practice of collecting data of new investments abroad yield a total for 1907 of about 100,000,000*l.*

Summing up the various elements in the calculation we arrive at a total estimated income for the inhabitants of the United Kingdom in 1907 of 2,000,000,000*l.* within less than 10 per cent. above or below so far as the estimates may be regarded as within the mark. These estimates, then, show about one-sixth of the national income as saved, about a quarter as due to trade and transport within the country, and about a third as representing the value added in productive industries (after deduction of the allowance for wear and tear of plant) using the word productive in the sense in which it is commonly employed, and without any purpose of raising a discussion on the proper connotation of the term.

The problem of the value of the capital wealth of the country was, happily, one which it was not necessary to re-examine, though, in view of the importance of the necessary provision for its renewal and maintenance, and the fact that the bulk of the provision for such renewal and maintenance is derived from the output of the industries whose returns it was the work of the Census of Production Office to examine, the amount which may be accepted as representing the capital wealth is naturally of great importance in connection with the results of the Census. It is a pleasure to know that the Society may hope to hear more on this subject in the near future from Mr. Bernard Mallet, whose further contribution will be awaited with much interest.

In closing I may be allowed to express the hope that, as in the case of the First Census, the Census of Production Office will

receive the cordial co-operation of manufacturers in making their Returns for the Second Census, the schedules for which have now practically all reached the hands of those whose duty it is to fill them up. In view of the somewhat narrowed scope of the Second Census (in that the building trades are not to be called on for Returns on this occasion, nor are those who are solely engaged in laundry work or bottling, while in all trades establishments employing five persons or less on the average are to be exempted on declaring the fact), the proper comparison of the results of the Second Census with those of the first will necessitate the preparation of some information not at present published, namely, the separate totals for the firms employing five persons or less. We shall thus be placed in possession of an item of information which will be of no small interest in itself. It may be hoped that the restrictions which have been admitted for the purposes of the Second Census will facilitate considerably the work of securing the Returns, and enable the work of compilation to be proceeded with more speedily than on the first occasion. In this matter everything depends on the willingness of manufacturers to afford the information asked for; and if they will realise the value and national character of the work in which they are invited to take a share, their assistance will enable the Census Office to expedite the performance of the duties with which it is charged.

APPENDIX.

In cases marked thus *, the output is valued at cost.

Persons of 18 years of age and upwards are classed as adults except in cases marked thus †, where the line of division is taken at 16 years.

Separate particulars of the classification of persons employed are not available for the several divisions of the United Kingdom in the case of the trades the names of which are printed in *italics*. In these cases only totals for the United Kingdom are published.

Trade.	Net output per head.	Average numbers employed (excluding outworkers).				Establishments using power.		Workshops (not using power).	
		Boys.	Men.	Girls.	Women.	Net output.	Number employed.	Net output.	Number employed.
	£					£000.		£000.	
Flax scutching	19	229	2,516	94	1,023	74,	3,862	—	—
Fish curing.....	30	632	6,214	503	17,959	73,	1,531	695,	23,777
Velvet and fustian cutting	33	40	751	788	1,864	62,	1,851	50,	1,592
Local Authorities, Ireland	36*	191	26,590	—	61	730,*	17,109	224,*	9,733
Army bakeries	47*	—	136	—	—	2,*	58	4,*	78
	32	1,092	36,207	1,385	20,907	941,	24,411	973,	35,180
Flock and rag.....	52	139	1,631	581	4,034	132,	2,120	199,	4,265
Cardboard box	52	1,054	3,779	5,133	11,402	937,	17,601	177,	3,767
Hatters' fur.....	53	25	276	230	1,494	106,	1,933	2,	92
Silk	55	2,123	7,917	5,613	16,515	1,750,	32,051	12,	147
Laundries	55	4,011	18,796	16,673	32,041	6,250,	106,177	959,	25,344
Army laundries.....	57*	—	12	—	78	7,*	108	0,*	12
Toys and games	59	234	565	451	609	61,	963	49,	899
	54	7,536	33,036	28,684	126,173	9,243,	160,953	1,398,	34,526
Jute, hemp and linen.....	61	11,341	38,206	21,554	83,395	9,126,	154,293	26,	203
Hosiery	61	1,892	11,125	9,973	28,223	3,013,	48,398	126,	2,815
Clothing	62	12,033	85,209	81,980	262,793	11,144,	192,701	16,183,	249,374
Royal Army Clothing Factory...	63*	6	152	23	1,372	98,*	1,553	—	—
Needles, pins, &c.....	64	682	3,838	2,401	6,328	799,	12,324	47,	928
Artificial flowers, &c.	64	45	351	996	2,214	—	—	232,	3,606
Wigmaking	64	22	217	229	402	—	—	56,	870
G.P.O. (telegraphs and tele- phones).....	64*	538	9,480	—	153	655,*	10,171	—	—
Office of Works (blind and carpet stores).....	65*	21	14	—	—	—	—	2,*	35
Board of Public Works (Ireland)	66*	2	549	—	31	38,*	582	—	—
Hats, caps and bonnets	67	1,838	12,047	3,125	14,100	1,399,	21,383	671,	9,727
Basket and wickerwork	67	458	2,581	137	436	34,	520	208,	3,095
Salt mines and works	67	367	3,930	139	300	319,	4,736	—	—
Mines, other than coal and iron	68	662†	17,297†	28†	246†	1,168,	17,116	63,	1,117
Local Authorities, Scotland	68*	153	15,205	3	82	850,*	10,236	198,*	5,207
Elastic webbing	68	243	1,320	792	1,815	279,	4,090	4,	80
China and earthenware	68	6,276	33,724	7,815	20,353	4,514,	66,308	116,	1,860
Cocoa nut fibre, &c.	68	466	2,433	745	2,638	377,	5,448	50,	834
Canvas goods	68	332	2,923	570	3,638	402,	5,743	107,	1,720
Tramway, &c., companies.....	68*	213	4,268	1	15	290,*	4,273	17,*	224
Saddlery and harness	68	1,654	10,603	893	2,593	462,	6,827	615,	8,916
Naval Ordnance Department ...	69*	44	1,074	—	—	77,*	1,118	—	—
Local Authorities, England and Wales	69*	2,162	140,131	16	689	8,815,*	119,141	1,121,*	23,860
	64	41,510	396,693	131,423	431,816	44,159,	686,961	19,842,	314,471

Trade.	Net out- put per head.	Average numbers employed (excluding outworkers).				Establishments using power.		Workshops (not using power).	
		Boys.	Men.	Girls.	Women	Net output.	Number em- ployed.	Net output.	Number em- ployed.
	£					£000.		£000.	
Woollen and worsted	70	22,579	91,757	35,306	111,379	18,270.	260,303	327.	3,718
Railway companies	71*	13,236	226,786	260	1,558	17,058.*	240,716	48.*	1,124
Blacksmithing	71	3,025	17,615	24	225	510.	6,307	938.	11,582
Boots and shoes	71	15,059	76,099	10,822	21,846	7,531.	105,202	1,151.	21,624
Naval Establishments (build- ings)	71*	98	4,389	—	1	319.*	4,488	—	—
Watch and clock making	72	631	3,410	365	895	217.	2,824	165.	2,477
Slate quarries	72	892†	13,199†	—	9†	974.	13,314	70.	1,086
National Telephone Company	73*	382	6,616	—	—	—	—	510.*	7,028
Cutlery	73	1,488	10,286	967	2,090	888.	10,786	193.	1,045
Quarries, other than slate, iron and limestone	75	1,158†	40,448†	—	62†	2,522.	32,800	603.	8,868
Rope and twine	75	2,182	4,780	1,802	5,495	965.	12,345	107.	1,914
Manufactured stationery	75	2,043	8,501	4,896	10,787	1,750.	22,665	227.	3,562
Pens, pencils, &c.	77	379	1,551	968	3,530	483.	6,283	7.	85
Travelling bags	77	718	3,049	1,083	1,955	248.	3,221	276.	3,584
Brushes	77	1,131	5,783	1,205	3,020	643.	8,142	216.	3,000
Ivory, bone, &c.	77	1,406	6,449	1,789	3,631	706.	8,815	322.	4,460
Brick and Fireclay	78	8,915	56,303	493	3,851	5,247.	66,108	210.	3,484
Cotton	79	51,153	168,827	89,761	262,321	44,976.	571,379	31.	683
Canal, &c., companies	79*	309	7,032	—	6	593.*	6,667	47.*	680
	75	126,817	753,210	149,681	438,661	103,873.	1,332,365	5,748.	86,004
Umbrellas, &c.	81	728	3,461	751	2,623	429.	5,524	181.	2,039
Locks and safes	82	908	5,665	419	930	595.	6,981	51.	941
Timber	82	10,704	61,696	848	1,975	5,808.	67,115	625.	11,108
Carriages and wagons	82	4,291	31,152	164	755	1,964.	20,831	1,027.	15,531
Anchor, chains, &c.	83	3,424	14,411	2,633	7,556	2,211.	25,833	103.	2,191
Fellmongery	83	142	1,575	2	45	81.	1,165	66.	599
Building and contracting	84	38,361	472,358	688	2,586	22,662.	250,880	20,264.	263,113
Cocoa, confectionery, &c.	84	3,158	18,558	11,603	27,973	4,930.	58,211	208.	3,081
Office of Works (building)	84*	16	539	—	8	—	—	47.*	563
Naval Victualling Yards	86*	—	29	—	—	2.*	29	—	—
Limestone quarries	87	364†	15,811†	1†	17†	1,043.	11,366	371.	4,827
Galvanised sheet, hardware, &c.	87	9,407	47,476	5,369	12,525	5,774.	63,822	767.	10,955
Printing and bookbinding	88	23,053	91,432	19,385	36,836	11,789.	165,971	555.	8,145
Tools and implements	88	3,503	17,810	636	1,762	1,905.	20,191	185.	3,520
Finished brass	89	5,415	25,360	1,937	6,204	3,248.	36,915	206.	2,901
	85	103,884	813,333	44,436	101,793	65,444.	734,834	24,656.	328,614
Coopering	91	642	4,265	5	27	284.	2,673	166.	2,266
Gloves	91	338	2,035	703	1,752	389.	4,186	51.	612
Crates, &c.	91	2,355	9,107	299	1,012	1,098.	11,006	70.	867
Plate and jewellery	94	4,227	20,312	4,061	9,758	3,065.	31,763	544.	6,625
Glass, stone, &c.	94	8,697	38,518	856	2,615	3,856.	40,545	906.	10,111
Matches, &c.	96	260	982	937	2,077	398.	1,095	11.	161
Shipbuilding	97	2,910	15,113	792	1,813	2,000.	20,628	—	—
Shipbuilding (Government Yards)	97*	1,607	23,687	4	282	2,470.*	25,969	19.*	241
Lace	98	2,601	13,777	5,422	15,037	2,761.	28,477	834.	8,163
Shipbuilding	98	21,314	165,751	179	1,038	18,234.	141,817	300.	3,495
Royal Ordnance Factories	100*	911	13,425	—	197	1,452.*†	11,533	—	—
	97	45,895	307,002	13,258	35,608	36,006.	369,192	2,941.	32,574

Trade.	Net output per head.	Average numbers employed (excluding outworkers).				Establishments using power.		Workshops (not using power).	
		Boys.	Men.	Girls.	Women	Net output.	Number employed.	Net output.	Number employed.
	£					£000.		£000.	
<i>Furniture, &c.</i>	101	14,297	64,634	2,904	10,271	7,415,	66,389	1,884,	25,717
<i>Bleaching and dyeing</i>	101	11,758	73,357	4,622	14,076	10,425,	103,202	58,	611
<i>Billiard tables, &c.</i>	101	658	4,096	629	1,127	496,	4,780	162,	1,730
<i>Type founding, &c.</i>	102	1,060	4,455	362	642	509,	4,607	157,	1,912
<i>Bread, biscuits, &c.</i>	104	15,179	71,495	6,208	17,175	7,264,	60,004	4,256,	50,353
<i>Musical instruments</i>	105	1,274	8,326	111	390	827,	7,675	229,	2,426
<i>Scientific instruments</i>	108	2,228	8,301	1,194	2,533	1,364,	12,336	171,	1,860
<i>Wrought iron and steel tubes</i> ...	108	3,132	16,875	44	172	2,484,	20,118	5,	105
<i>Cycle and motor</i>	109	7,187	39,886	1,915	5,055	5,489,	47,824	412,	6,219
<i>Engineering</i>	109	64,354	380,446	5,081	11,822	50,227,	458,568	268,	3,135
<i>Heating, &c., engineering</i>	109	1,362	10,442	500	2,048	1,464,	13,559	103,	763
	107	122,489	682,313	23,570	65,581	87,664,	799,122	7,705,	94,831
<i>Small arms</i>	111	452	4,223	31	149	485,	4,177	53,	678
<i>Paper</i>	111	3,542	21,079	2,924	10,410	4,542,	40,955	—	—
<i>Fancy tur</i>	112	260	2,565	374	2,040	181,	1,809	406,	3,430
<i>Iron and steel</i>	115	23,758	234,589	878	2,411	29,893,	260,396	155,	1,300
<i>Wire</i>	116	2,714	13,597	611	1,377	2,047,	17,240	73,	1,089
<i>Leather</i>	117	2,274	25,058	471	1,107	3,287,	27,870	98,	1,040
<i>Trade photography</i>	118	97	542	55	317	55,	393	64,	618
<i>Explosives, &c.</i>	118	619	6,601	1,295	4,229	1,482,	12,323	27,	421
	115	33,716	311,254	6,669	22,070	41,972,	365,133	876,	8,576
<i>Oil shale mines</i>	122	274†	4,002†	—	—	523,	4,276	—	—
<i>Railway carriage building</i>	123	3,438	25,168	76	175	3,556,	28,773	6,	84
<i>Rubber</i>	124	1,988	13,252	1,948	6,841	2,883,	23,424	93,	615
<i>Aerated waters, &c.</i>	125	3,324	19,753	479	5,101	3,466,	27,382	111,	1,275
<i>Butter and cheese</i>	125	700	6,607	435	1,591	1,162,	9,259	6,	74
<i>G.P.O. (printing and envelopes)</i>	126 ^a	17	20	—	—	5 ^a ,	37	—	—
<i>Coal mines</i>	127	59,769†	773,373†	645†	4,799†	105,735,	833,531	355,	5,055
	126	69,520	842,175	3,583	18,507	117,330,	926,682	571,	7,103
<i>Cement</i>	132	900	13,807	7	105	1,940,	14,691	15,	128
<i>Lead, tin, &c.</i>	133	540	6,664	355	674	1,067,	7,811	30,	422
<i>Copper and brass</i>	137	2,540	18,108	169	631	2,802,	20,231	128,	1,217
<i>Asbestos, &c.</i>	137	104	1,628	100	517	308,	2,221	13,	128
<i>Preserved meat, pickles, &c.</i>	141	521	5,385	1,583	5,771	1,739,	11,198	136,	2,065
<i>Bacon-curing</i>	146	357	5,560	98	1,245	936,	6,306	123,	954
<i>Ordnance Survey Department</i>	148 ^a	26	315	5	87	64,	433	—	—
	137	4,982	51,467	2,317	9,033	8,856,	62,891	445,	4,914
<i>Fertilisers, &c.</i>	154	690	10,702	174	908	1,903,	12,312	17,	132
<i>Tobacco</i>	155	1,929	10,285	9,035	16,399	5,541,	33,317	276,	4,331
<i>Botling</i>	155	3,393	12,782	717	3,373	2,690,	16,362	480,	3,903
<i>Soap and candles</i>	155	2,326	11,889	1,151	3,052	2,841,	18,185	62,	533
<i>Iron mines</i>	155	268†	10,981†	—	3†	1,658,	10,157	90,	1,095
<i>Cattle, &c., food</i>	158	203	1,544	21	212	305,	1,938	8,	45
<i>Pharmaceutical preparations and cleansing and polishing articles</i>	174	1,025	5,123	1,839	3,331	1,947,	11,114	71,	504
<i>Manufactured fuel</i>	174	50	1,486	—	1	296,	1,527	1,	10
	157	9,854	65,092	13,240	27,279	17,124,	104,912	1,005,	10,553
<i>Grain milling</i>	178	1,595	33,511	129	942	6,453,	36,177	—	—
<i>Seed crushing</i>	180	201	7,111	3	81	1,388,	7,696	—	—
<i>Chemicals and drugs</i>	183	3,554	12,136	1,647	4,920	8,866,	49,052	702,	3,205
<i>Oil and tallow</i>	189	319	5,263	15	160	1,051,	5,429	62,	458
<i>Printing and publishing</i>	190	6,073	36,792	1,049	2,872	8,831,	46,480	36,	306
<i>Gold and silver refining</i>	197	101	1,973	25	88	431,	2,187	—	—
<i>Paint, colour and varnish</i>	198	1,175	11,419	170	1,976	2,706,	13,565	38,	275
	185	13,018	138,635	3,038	10,139	29,726,	160,586	838,	4,244

Trade.	Net output per head.	Average numbers employed (excluding outworkers).				Establishments using power.		Workshops (not using power).	
		Boys.	Men.	Girls.	Women.	Net output.	Number employed.	Net output.	Number employed.
	£					£000.		£000.	
Gas undertakings—									
Public authorities	200	559	27,911	3	98	17,098,	{ 28,500 53,680 }	189,	{ 74 1,186 }
Companies	211	1,808	52,833	8	217				
Ice	212	26	1,203	3	13	261,	1,245	—	—
Spirit distilling	227	185	6,190	7	143	1,470,	6,491	11,	34
Shale oil works	229	311	3,071	2	7	777,	3,391	—	—
Electricity undertakings—									
Companies	235	457	7,954	4	84	1,996,	8,499	—	—
Public Authorities	254	457	13,559	2	101	3,592,	14,119	—	—
Coke works at collieries	273	226	10,699	1	62	2,639,	9,335	357,	1,623
Ink, gum and sealing wax	280	94	1,281	100	180	422,	1,344	41,	311
Spirit compounding, &c.	354	46	1,045	11	33	396	938	36,	197
Water undertakings—									
Companies	366	105	4,583	—	27	7,978,	{ 4,420 11,518 }	1,097,	{ 295 2,871 }
Public Authorities	423	287	17,008	1	93				
Brewing and malting	485 [‡]	5,126	77,855	189	1,799	10,043,	79,680	1,178,	5,289
Sugar and glucose	506 [§]	485	5,798	35	183	3,291,	6,701	—	—
	339 [¶]	10,172	230,963	366	3,040	79,933,	232,661	2,909,	11,880

‡ Or 331/, exclusive of beer duty.

§ Or 172/, exclusive of duties on sugars, molasses and glucose.

¶ Or 276/, exclusive of beer and sugar duties.

Summary of the preceding table.

Net output per head.	Average numbers employed (excluding outworkers).				Establishments using power.		Workshops (not using power).	
	Boys.	Men.	Girls.	Women.	Net output.	Number employed.	Net output.	Number employed.
					£000.		£000.	
Under 50/,	1,092	36,207	1,385	20,907	911,	24,411	973,	35,180
50/, and under 60/,	7,586	33,036	28,684	126,173	9,243,	160,953	1,398,	34,526
60/, " 70/,	41,510	396,683	131,423	431,816	44,159,	686,961	19,842,	314,471
70/, " 80/,	126,817	753,210	149,681	438,661	103,873,	1,382,365	5,718,	86,004
80/, " 90/,	103,884	813,333	44,436	101,795	65,441,	734,834	21,656,	328,614
90/, " 100/,	45,895	307,002	13,258	35,608	36,006,	369,192	2,901,	32,571
100/, " 110/,	122,489	682,313	23,570	65,581	87,664,	799,122	7,705,	94,831
110/, " 120/,	33,716	311,254	6,669	22,070	41,972,	365,133	876,	8,576
120/, " 130/,	69,520	842,175	3,583	18,507	117,339,	926,682	571,	7,103
130/, " 150/,	1,988	51,467	2,317	9,033	8,856,	62,891	445,	1,914
150/, " 175/,	9,854	65,092	13,240	27,279	17,124,	104,912	1,005,	10,553
175/, " 200/,	13,018	138,635	3,038	10,139	29,726,	160,586	838,	4,244
200/, and over	10,172	230,963	366	3,040	79,933,	232,661	2,909,	11,880
Total.....	590,541	4,661,370	421,650	1,310,609	642,278,	6,010,793	69,867,	973,467

DISCUSSION *on* MR. FLUX'S PAPER.

SIR GEORGE PAISH, in proposing a vote of thanks to Mr. Flux, said he thought they would all agree with him that the amount of work put into the Paper was enormous. Rarely had a Paper been read before the Society to which so much work and labour had been devoted. He thought Mr. Flux had been very successful in something more than the mere compilation of the Census. He had succeeded in getting information concerning the work done by over 7,000,000 Englishmen, and, as they knew, it was extremely difficult to get information in this country concerning what people were earning or what results they were obtaining from their businesses. He thought they ought to compliment Mr. Flux on the great ability he had shown in getting so much information from companies and individuals in all parts of the country. The lessons to be learnt from the Paper were many, and Mr. Flux had already given them some of them. It would take a long time to gain all the benefits which the information rendered possible. One of the lessons was that women were in competition with machinery; another that the introduction of machinery was adding very largely to the wealth production of the country from year to year. If they looked at the figures they would see that industries in which machinery was used were very much more productive than industries in which no machinery was employed, and that the industries in which machinery was not used mainly employed women, or a very large proportion of women. He hoped the time was not very far off when they would succeed in increasing the wealth production of the country to such an extent that all the married women could stay at home to attend to their households. With regard to the total figure of wealth production, Mr. Flux had arrived at the conclusion that in 1907 the income of the country was about 2,000 millions, and he had more or less confirmed an estimate which he (the speaker) had made last year, that the income of the country was about 2,250 millions. If they allowed for the expansion since 1907, the two figures were almost identical. There was the difference, however, that in his calculation he had estimated something for the earnings of married women in their own households, whereas Mr. Flux had excluded them. It had never been the practice in any country to include the wealth produced by the married women. If they thought of the matter for a moment, they would realise that the wealth produced by married women was very great. It was true that they did not receive money wages; but the family received value in some form or another. It was a matter of no small importance, especially when one came to compare the income of the various nations and to take into account the relatively large portion of the income contributed by married women in countries where wages were low. It was indeed absurd to leave out the wealth produced by married women. The incomes derived by domestic servants, teachers, &c., were, of course, included, and the work performed by married women was of a similar character. They did the work of the

household ; they made the clothes of the children ; they doctored them and even educated them, and they performed a great many other tasks of great value. The wealth produced by married women thus amounted to a very large sum in the aggregate. With regard to capital, he was very glad that Mr. Bernard Mallet had promised another contribution on this subject. The information they possessed with regard to the capital of the country was very meagre, and he was hoping that some day or other the Census of Production Office would try to ascertain the real wealth accumulated by the country, and that we should no longer depend upon estimates. Mr. Flux had told them that he proposed in the new Census to make additional investigations as to the amount of the income of the transport and distributing industries. They might hope that in time the full income of the country would be exactly compiled, so that there might be no doubt concerning the greatness of the income which this country was now enjoying.

Mr. CHIOZZA MONEY, in seconding the vote of thanks, said it was impossible to praise too highly the great work which Mr. Flux had done. For the first time it had enabled them to form a qualitative analysis of the national dividend as opposed to the quantitative analysis with which they had been content in the past. Those who had thought of these things for some years were not surprised to find that in the United Kingdom, which they should remember was one of the only three great manufacturing countries of the world, the production of manufactures, added to the production of minerals at factory prices, amounted to so small a sum. It was a fact which could be deduced approximately, of course, from the national income ; but to have it plainly revealed, as the work of the Census Office had revealed it, he thought should give everybody cause for very great thought indeed. What was remarkable was not that our material production was great, but that it was so small. The Paper reminded them that in trades familiar to them the product of the country was extremely small. The whole of a year's product of wooden furniture and upholstery, for example, after adding a percentage for retail distribution, and taking into account not only furniture for homes but for offices, &c., was something like 10 millions at retail prices, not factory prices. That was adding about one-third for the cost of distribution. That was an extraordinary fact, and that and other facts showed them how they could use the Paper to arrive not at what the payment of their people was in terms of money, but what it was in terms of goods—how many goods they were paid, what they were paid in food, what they were paid in housing, what they were paid in the furnishing of houses, and so on. Another point arising in that section was, how far the national dividend was capable of transformation, without diminution, by social change. If they took, as they were doing in the forthcoming year, 13 millions chiefly from the income-tax paying classes and transferred it to so many poor old people, what happened ? They took spending power from a limited number and gave that equivalent of spending power to a large

number. If they had left that spending power in the upper regions it would either have been invested or spent in certain ways. If they transferred it to the other end of the scale, it obviously would not be invested, because the old people could not afford to invest ; it would be spent on the necessities of existence. Therefore, by that social act they did not increase, but they transmuted part of the national dividend ; instead of its being expressed in certain things it was expressed in certain other things. Another point was the cost of retail distribution. He quite agreed with the figure Mr. Flux had suggested, because for some years he had been investigating the subject, and he had found whether they took cycles, hats, boots, or furniture, or whatever it was, if they translated factory price into retail shop price they had to add about one-third. A 9*l.* cycle at Coventry was a 12*l.* cycle in London ; that was to say, there was a third on. So that every time one went into a shop to buy goods, 25 per cent. of what one paid was the difference between retail and factory prices. He hoped Sir George Paish would forgive him for slightly differing from him with regard to married women. He himself had not included married women in estimating the national dividend, and for the plain reason that they were not paid. It was true they slaved and drudged ; it was true their work pulled the home together as nothing else could pull it together, but they were not paid, and the very fact that they were not paid was a very serious thing. It meant that what ought to be an income for one person became an income for three or four or five people. The question of the "family income" was involved in that. They had heard a good deal of it ; because since he had published "*Riches and Poverty*" all sorts of apologies had been offered with regard to the small incomes of the poor, and in order to enlarge those poor incomes certain statisticians had said, "The family not only gets 25*s.* a week from the father, but also 5*s.* earned by the boy or girl." Of course it did ; but that was not an excuse but an indictment, because the boy and girl ought not to be earning at all ; they ought to be continuing their education. The tables on page 567 were of the deepest importance, he thought, and he was obliged to Mr. Flux for giving them in that illuminating form. In connection with the Census of Production, he had heard it stated in the House of Commons that it was impossible to pay a better wage to men, because the average net product, as revealed by the Census of Production, per man was only 100*l.* a year. That was so, but that was the average of all trades and all workers. Mr. Flux's table analysed the workers into men, boys, girls and women. Where the average net output was 75*l.* to 100*l.* they found there were no less than 800,000 boys, girls and women employed, as against 1,000,000 or so men. Taking the next line, 100*l.* to 125*l.*, they noticed directly they got over the 100*l.* line the males preponderated by a large number. In short, it was not true that British working men had an output worth only 100*l.* a year. Those who were in favour of the idea of the minimum wage in industry did not forget that. They urged that Trade Boards should be established which should deal with each industry on its merits, and establish a minimum wage

which should have proper regard to the productivity of each particular industry. Mr. Flux had brought out the variability of employment extremely well in the Paper, and that was another matter on which the Census was going to give them increasing information. When they found, as they did, in an industry which had a certain general product, like the building industry, it was possible to employ salaried earners with fair regularity, while the wage earners were employed with extraordinary irregularity, they were faced with a social problem which demanded their close attention. The railway industry did not employ men like that. It was true that railway work was not so irregular as the building industry, but it experienced very great fluctuations. Of course, production was the only possible stable basis for such a country as ours, and therefore they had very gravely to consider whether their production was great enough, whether the figure which Mr. Flux had mentioned for the industrial capital was big enough, and whether they were doing all they possibly could with their natural resources. The United Kingdom was really a poor country, with few assets, the chief of which was coal; but that was such an enormous asset that it was questionable whether by this period of development in their economic history they ought not to secure a larger production than was shown in the Paper. The extraordinary progress of invention, the extraordinary facilities with which common goods could be produced by machinery, in his opinion, by this time should have given them a larger output of goods than was enjoyed at the present time. The chief lesson of the Paper was not only that there was an unequal distribution of wealth in the United Kingdom, but that the wealth produced was not large enough, so that, even if it were evenly distributed, it was not enough to raise to a high standard of living the whole population. So that they had not only an "error of distribution," as he had once called it, to deal with, but also an "error of production." If Mr. Flux's great work helped the nation to think gravely on these things, and to arrive at a better industrial organization and development, it would be one of the best things ever done, not only for the science of statistics, but for the welfare of the country at large.

Mr. H. L. SYMONDS (Chairman of the Manufacturers' Section of the London Chamber of Commerce) said one of the most valuable parts of the Paper was to be found in the appendix, in which the product of all the trades was set out from the lowest to the highest in progressive form. This, he believed, was an addition to the tables in the Census of Production Report, and it seemed to him an extremely valuable one, because it was absolutely essential to the knowledge of the truth of the comparative prosperity of the various industries that they should know how much capital (or, in other words, accumulations of labour) was invested in each particular trade; while the results given, varying from 19l. to 300l., as Mr. Flux had rightly pointed out, provided not only the remuneration for the labour but the return for the capital. He thought if even a very small return were taken away as that which was rightly due

to capital, in many trades it would be shown that the remuneration of the labour employed was most beggarly. He thought it behoved all manufacturers to consider the desirability of seeing whether they could not do something to check the internecine competition which was largely responsible for the terrible and unnecessary reduction in the amount of the yield as a whole. He believed it was the Prime Minister who once said that "competition was often fratricidal in intention, but suicidal in effect"; and if they could do something to modify this they would have achieved a great deal. Another important point was whether they did not waste a great deal too much in the methods of transport and distribution of products. He was inclined to think it was on that side that probably the greatest possibility of further increase in riches could be looked for.

Mr. E. A. H. JAY said that Mr. Chiozza Money had referred to the fact that production was not as great as it ought to be. They always understood that the introduction of machinery would naturally result in a considerable increase in production; but in order to be satisfactory from the point of view of the workmen that increase must be very large indeed. It appeared from the Paper that in factories the output per head was very much larger than in workshops. From one point of view that was a good thing, because the cost of production was reduced; but it also meant that the number employed must be smaller, and it seemed to be quite clear that the introduction of machinery had resulted in human skill being employed to a much smaller extent than hitherto. At any rate, even if it could be shown that the total number employed had increased, human skill was not employed to the same extent. If the introduction of machinery had not resulted in a considerably larger production generally, it seemed to him to have produced a very difficult state of things. He cited the instance of the Port of London building new docks on the Thames, an enterprise which he said had caused a very great demand for additional labour, but which had been recently checked considerably by the introduction of a machine known as the "German Navy," which was going to do work that would have occupied some 200 men. That very largely reduced the number employed. But if production was not going to be very greatly increased by such inventions, it seemed to him that in the future comparatively few men would be able to earn a decent wage, because less and less skill was required, even if they were employed at all, a large proportion being only required to tend a machine. He asked the reader of the Paper to give his view as to what was likely to be the result of the process of development which was now apparent.

Mr. MACROSTY said that Sir George Paish and Mr. Chiozza Money had cast upon the Census of Production Office in taking the Second Census tasks which were immensely heavier than the extremely heavy task which was taken during the First Census; because Sir George Paish wanted the Census Office to collect

information with regard to the cost of transportation and distribution. Mr. Money had echoed the same desire, and both had indicated a strong wish that they should get closer information as to the industrial capital of the country. It was most desirable to get those things; but a Government Department could only get that information which it was empowered to get, and Mr. Money would remember that the powers which were conferred on the Census of Production Office were very strictly limited by the Parliament which passed the Act, and of which he was a distinguished member. So that before they got any of that information, further powers would have to be given to the Census of Production Office. Those people who wished Government Departments to do things should say very clearly what they wanted them to get. It was very simple to say: ascertain from the manufacturers themselves what is their capital. But what was their capital? One could turn up the Stock Exchange Year Book and get the face value of a company, or one could turn up the prices of the day and get its market value; but what about its secret reserve and its depreciation fund? Were its reserve and its depreciation fund in its business, or were they invested in outside securities? Were those industrial securities part of the capital of other firms which was being returned? It was extraordinarily difficult to frame a questionnaire, the answers to which would enable them to get correct information in the case of any one firm. It would be rather difficult to frame such a questionnaire at all, and still more difficult to frame it in a way which would not lead to the risk of its being unintelligible to the people who had to fill it up. He suggested that the estimates which had been put into the Final Report of the Census with regard to the addition to factory values in order to arrive at the final retail prices, and the calculation which had been made as to the industrial capital of the country, were not very far wrong, and the reason was that they fitted in with everything else. Those calculations were not made in a hurry. He thought Mr. Flux would remember they were at work on them for a very large portion of six months, making inquiries. They had to ransack every source of information, official and unofficial, which was known to them, and in the case of the capital they finally checked it off by comparing the figures with the figures which were published for the United States Census of Production. They had another element of control in the ascertained value of the production of goods for capital uses which was recorded in the Census, and they found that their calculated figures and the returned figures of the United States were in the same order of magnitude. They might be able to shift that 1,400 to 1,600 millions by 100 millions or so one way or the other, but they were not going to make it up to 2,400 or 2,600. He had nothing to do with the deductions that were to be drawn from that, as to whether it was good enough or not. He was exceedingly pleased to hear that Mr. Chiozza Money, who had devoted so much attention to the subject, confirmed the estimates which they had finally decided upon as to the addition to be added to factory values in order to arrive at retail prices.

Mr. W. M. ACWORTH asked on what lines the division between production, or transport and distribution, as the case might be, and services was made. They all knew a weaver was a producer, but what was an overlooker? They knew that a goods loader was a transport worker; what was a goods checker? And if a goods checker still came in as a transport worker, what about the invoice clerk in the room upstairs? He asked whether Mr. Flux could give any proper definition of the line that was drawn between the hand workers and the men at the top, and state on what principle it was drawn. One could imagine the clerk of a produce broker being treated in one way and a clerk in a Stock Exchange office in another way.

Mr. J. C. STAMP said they felt that Mr. Flux had added very much to their knowledge by the fine summary he had made at the beginning of the official report, and it was splendidly supplemented by the Paper that evening. He thought that Mr. Macrosty ought to be included in their congratulations, as he had had so much to do with the matter. With regard to the broad result which had been brought out by the comparison of industries using machinery with those not using machinery, before they jumped to conclusions they must remember it was an unfinished sum, and although a strong probability had been pointed out, they must remember that in the net output in the case of machinery very considerable allowances had to be made. It would be very useful if they could calculate the real amount per head for each group. There was an amount to be taken out of the net output for depreciation of machinery and all the allowances for the special items that machinery entailed, even including the extra rent of the building used. They ought to dissect the wages and take out the wages of those who looked after machinery, boilers, and so on, distinguishing those who did actual manufacturing work, before they came to general conclusions about the relative wages. He did not quibble about the general conclusion, but he wished to point out that it was not absolutely proved. It was perfectly true that the greatest value of the Census would be revealed when they had a succession of them and were able to test the results in relation to the time element and to see the relative shifting of the parts. It was perfectly clear from Mr. Flux's Paper, and the various remarks that had been made, that there was an immense field for investigation open merely on the statistical aggregates; but he put in a plea on a question which had not been touched, viz., the sectional use of figures by individual persons interested in individual trades. In the case of a manufacturer who was good enough to answer the questions put to him, who, when the official report came out, wanted to see how he stood in relation to the aggregate of which he formed the part, he would like to see something set forth more clearly than they had at present to enable him to compare the various parallel items of his accounts with the items in the official report. They knew that all industries did not make up their trading and profit and loss accounts in the same way. Some put one item into one, and others put it into

another, while others, again, made up only one account. But it was possible, after he had steered his way through all the remarks, to take off the necessary expenses—for instance, the cost of coal from one account, and add that to the cost of materials before arriving at his gross profit; and he would then compare his gross profit with the net output. It should be noticed that by the method adopted in the Census of Production the final stock, and not the initial stock, was included in the sales of the year, but it was valued at sale prices, whereas in general the trading account considered stock always at cost, so that the effect on the net output was to include the unrealised profit on the difference between the stocks. If they took an account in which there was material difference between the opening stock and the final stock, they would find, working out on the lines of the Census the net output on that particular account, that they had an unrealised profit on that difference in stocks. The manufacturer of course did not count his chickens until they were hatched, but the net output of the Census of Production had that effect. The value of the figures for gross output seemed to him, after handling it in a practical form in connection with a great number of accounts, to be in the inverse ratio to the complexity of the industry. Directly they got a simple industry that had not a great deal of differentiation in its processes, the gross output was comparable with the gross sales plus stock of that concern. He thought it was a great pity that the Census of Production did not give amongst its other details the number of schedules or concerns in each section, so that anyone could see what was the average figure under each column. It was perfectly clear that it would be impossible to divide it up in many industries because of the revelation of independent details; but surely for the great industries it would be possible to say how many concerns there were, and the individual manufacturer could say whether he was what Dr. Marshall called a representative firm, or whether big or small. He knew that the proportion between the different columns was not altered—it was the same in the aggregate as it would be if divided by that unknown figure—and he was still able to divide his accounts to see whether he had the average net output, and whether his cost of coal and materials was larger and how he differed from what the representative one would be. But in using aggregate accounts and aggregate results for that most fascinating of all the problems—that was, what the actual profit was out of the net output—one must be very careful how one handled that mysterious thing the gross output, which could only be used with the greatest reservation. However, they were very thankful to find that the net output could be added, divided, cut up, and everything else done with it, but that they did not destroy its utility and excellence.

Mr. W. T. LAYTON asked with reference to the figure of 210 millions which was added as the output of the agricultural and fishery industries, whether Mr. Flux regarded that as being on precisely the same basis as the figure of net output for manufacturers.

If it were so, it seemed to him to be a very large figure, considerably larger than one expected from the returns issued by the Board of Agriculture; and it seemed to give a very large output per person considering the level of wages of agricultural labourers shown by the Earnings and Hours Enquiry of the Board of Trade, and such estimates of rent and farmer's profits as could be deduced from existing statistics.

Mr. YULE said that in view of his own Paper six years ago, he wished, before the discussion was closed, to congratulate Mr. Flux on the completion of the Census, the issue of his Report, and the writing of such an extremely interesting supplement to that Report. He would like to direct attention to the long paragraph on pp. 558, which he thought contained some of the most useful warnings that had been given. He did not think many of them had completely realised the source of the differences between some of the earlier preliminary reports and the final report, and it was very useful to have the full explanation put on record. The various tables respecting net output per head had considerably surprised him. The figures seemed astonishingly low: it was a striking fact, given on p. 563, that over $3\frac{1}{2}$ millions were engaged in trades in which the average output was below 100*l.* per head, and $2\frac{3}{4}$ millions only with a net output over that limit, or again, as shown on p. 570, that 51 per cent. of the employees in England and Wales, 57 per cent. in Scotland, and 82 per cent. in Ireland, lay in the three lowest grades—that was to say, the grades in which the output was under 100*l.* per head. Even deducting the lowest grade in which many of the trades might be seasonal, and the figure did not represent the complete annual output, the proportion in those lowest grades was very large indeed. The paragraph respecting the coal raised and the coal consumed interested him, and he had turned to the Paper by Mr. Price Williams which was read before the Society in 1889, as he had some recollection that Mr. Williams had formed an estimate of the domestic consumption of coal, and he wondered how that estimate compared with the estimate framed on the present basis. Mr. Price Williams did not seem to take into account the special consumption of coal in mercantile establishments; apparently he included it with consumption for “domestic purposes.” His estimate was that the consumption was only 17·4 per cent. of the total raised. On Mr. Flux's calculation it came to over 23 per cent., and it looked as if Mr. Price Williams had under-estimated the domestic consumption as he had also, and admittedly, considerably over-estimated the consumption on coastwise steamers. He confessed, in connection with the tables regarding the output per head, that he a little regretted the exclusion from the scope of the Census of the question respecting the total amount of wages paid. That was a question which was included in the Census of the United States and Canada, and in the Bill that was originally drafted there was a requirement as regards that head. But that requirement had been finally omitted by the Standing Committee as a result of agreement between both parties. Had they had such information,

it seemed to him it would have been possible to get more meaning out of the table on p. 567 respecting the number of boys, men, girls and women employed without having to conjecture coefficients for turning girls into women or boys into men. He would be glad if Mr. Flux would state, if he were free to do so, for what reason the building trades were to be excluded from the next Census. It was rather to be regretted that they would not have information on that rather important trade to follow the present Census. The exclusion of establishments employing five persons or less on the aggregate followed, he believed, the Canadian practice, and it would be interesting to see what proportion of establishments included in the present report would be eliminated when that was done. He did not think that the elimination would be of very serious disadvantage.

The CHAIRMAN said he wished to emphasise the last paragraph of the Paper, in which Mr. Flux invited the cordial co-operation of manufacturers, and stated that in this matter everything depended on the willingness of manufacturers to afford the information asked for. That invitation should receive the widest circulation, and all the support the Society could give it. Personally, he should like to adopt it for himself, because undoubtedly on the willingness of farmers to render returns entirely depended the calculations which it fell to the lot of his Department to make as regards the production of agriculture. He could not but feel inclined to envy, in one respect, the position of the Census of Production Office, for at any rate with all his difficulties, the Director had the compulsory powers of the Act to support him in his search for information.

Mr. FLUX, in reply, said that he had particularly wished to suggest to others that they might find many things worth looking for in the bulky report on the Census of Production, though there were certain classes of information which, for reasons that had been mentioned, had not been secured. As Mr. Stamp had suggested, the information relating to particular industries might have claimed attention, but he had deliberately confined himself to broader issues, deeming them to be of greater interest to the Society as a whole. Sir George Paish had suggested that the Census of Production showed a net output of 900,000,000*l.* sterling for 7,000,000 persons employed. He thought it was 700,000,000*l.* for 7,000,000, and, consequently, having 100*l.* a head, and something like 20,000,000 occupied persons, they did not get far away from the 2,000,000,000*l.* for the national income, even if they proceeded by that rough process of assuming a similar production of wealth per head to apply over the whole field of occupied persons to that which was revealed over that part of the field they had had to explore; so that there again they got close to that figure of 2,000,000,000*l.*, which almost became an obsession. Mr. Chiozza Money had suggested that the variability of employment for the wage earner was partly due to the regularity of the salary earner, or something of that kind. The substitution of a wage-earners' table for that relating to all employed

persons on p. 575 would, it was true, show greater variability in certain places, but the aggregate variability would be substantially the same as was shown for the aggregate of all employed. He did not think that Mr. Symonds quite meant what he conveyed to his mind when he spoke of the appendix to the Paper as being an addition to the Census of Production Report. It was not new information, it was only a re-arrangement. Throughout the Paper he had attempted to re-arrange the officially published data for certain specific purposes, and had not added any information to that which was contained in the Report. The matter was as available for any other student as for himself, and the appendix to his Paper could have been compiled by any other student from the pages of the blue-book. As had become clear in the course of the debate, the capital employed by manufacturers had not been returned to the Census Office, and it had been necessary to resort to estimates instead of compiling actual returns. Mr. Macrosty had sufficiently well indicated the difficulties that would have lain in their way if it had been their duty to extract from the manufacturers a return of their capital. He had endeavoured to picture the capital as a physical fact—the equipment of industry—and to value that physical equipment, provided to assist labour, at something like market prices. That was the kind of conception he had been trying to express in the aggregate figure for manufacturers capital contained in the General Report. He did not know that he would be prepared to assent to Mr. Jay's proposition that the introduction of machinery reduced the level of human skill. The construction of the elaborate machinery that was used in modern industry called for a very high degree of human skill, and the fact that so large a proportion of the total output of industry consisted of capital goods meant that a high level of human capacity was called for, and, further, it was not a very simple thing after all to run complicated machinery. It was true that some processes of using machinery were simply mechanical, but all of them were not, and he thought they would make a mistake in stating too low the capacity of a man who could control a complicated piece of machinery and keep it running sweetly and smoothly, and who, when it ceased to run sweetly and smoothly, was able to set it right again. It was rather a high order of capacity on the whole that was required to do that, and he was not inclined to belittle the demands of modern industry on the intelligence of those who had to conduct it, as compared with the earlier times. With reference to the question asked by Mr. Acworth as to line of division between the productive and distributive and other classes, he would try to indicate what had been done. On the production side everybody earned, whether he was a carter, or operated a mule or a loom, or was engaged in the counting house, had been included. Those who were occupied in any of the phases of transport and trading, whether they were railway labourers loading goods into a van, or railway clearing house clerks, were included in the distributive class. With reference to other services, there was a whole page devoted to their enumeration in the General Report. He would not attempt to read that, or even

summarise it ; but he thought a study of that page would show what was covered by the estimate for services. Some part of the service, rendered by lawyers, bankers, and some other classes, were services rendered directly to producing industries, and paid for out of the output of those industries. Allowance had been made for such services when making up the additional estimate for other services, so as to avoid counting the same thing twice. That kind of classification was, perhaps, a little difficult to express briefly, but he hoped he had managed to convey the general lines of thought that they had endeavoured to follow out. The total of 210,000,000*l.* given for agriculture was estimated to be roughly on the same basis as the net output for manufacture. Mr. Rew could speak to that better than he could, but he thought the way in which it was made up was shown on page 24 of the Report, and from that it would be seen that it was based on the value of goods sold off the farm. Allowance was necessary for manures brought on to the farm to maintain its fertility, and for machinery purchased and so on. The amount of output per head when they had deducted such items as these would not work out quite so high in comparison with the manufacturing output as Mr. Layton appeared to think. It had been suggested that the number of manufacturing establishments in the various industries should have been stated. The information readily available, namely, the number of Returns tabulated, would not be quite as illuminating as suggested. It did not mean the number of manufacturers there were in the country. Some manufacturers preferred to make separate returns for each of the establishments they maintained. Other manufacturers preferred to make a composite return for two or more establishments. A considerable amount of additional information, some of it not altogether easy to procure, would need to be published at the same time as the number of returns that were included on the tabulation sheets, if that number were to be at all useful. Although it looked as if it might be an instructive figure, he did not think it would be nearly as instructive as imagined, and that was one of the reasons it was not stated. So far as the Second Census was concerned, Mr. Yule had expressed regret that the building trade was not to be included. He would refer to page 761 of the Final Report, where it was stated that there were 118,000 schedules issued to the building and contracting trades for the First Census. Some 45,000 of them had been cancelled as duplicates, or as issued to persons no longer in business, the directories having been to some extent misleading, preserving in their columns firms which had ceased to exist or had moved to another address or had changed their name without changing their real identity. There were nearly 10,000 which were transferred to other trades, and only about 45,000 schedules were finally available for tabulation in the building and contracting trades. That indicated the amount of trouble presented in the First Census by these trades, and although he hoped it might be possible to see a way of getting over these troubles at some later Census, the figures given illustrated one important reason why the building and contracting trades had been excluded from the Second Census. But he repeated that their

exclusion from the Second Census did not prejudge any other census. It was only with regard to the Second Census that any decision had been taken. He thanked them for the way in which they had spoken about his Paper, but many of the remarks which had been made were applicable rather to the Report and to the Office over which he had the honour to preside, than to the Paper and to himself.

The following candidates were elected Fellows of the Society:—

C. N. Bell.
W. Collard.
J. Kitchen.

G. H. Pownall.
Miss D. M. Zimmern.

THE TENDENCY OF CHILDREN TO ENTER THEIR FATHERS' TRADES.

By Professor S. J. CHAPMAN and W. ABBOTT.¹

THE main object of the investigation of which the results are recorded in this paper was to get some idea of the tendency among young people in Lancashire and the vicinity to follow, or not to follow, their parents' callings. The method pursued was to select a number of evening continuation schools in different parts of Lancashire, and make inquiries of the scholars as to the trades and positions of their parents, themselves, and their brothers and sisters.² The ages of the scholars ranged from 15 to 30 and upwards, but for the majority they lay between 17 and 20. Printed forms were given out for the scholars to fill in, after the nature of the information required had been carefully explained to them. Nearly 3,000 forms in all were received, but as mistakes were made in a number of cases—including, unfortunately, all in Manchester—the total left to deal with finally was 2,415. Mr. Abbott attended at the schools and explained himself what was required, except at Manchester. The places sampled were Blackburn, Bolton, Burnley, Oldham, Rochdale, Stockport, and Walkden. In each place, as far as possible, information was sought from the same classes of schools.

In Table I the facts relating to males are set forth, except as regards the children of hatters. The latter will be dealt with separately, as hat-making is only found at one of the places covered by the investigation, namely, at Stockport. The significant thing to notice in the table is that in each vertical column the highest percentage is found, without exception, in the horizontal column relating to the same trade. Thus in the vertical column for the building and wood-working trades, the highest percentage is 24·2, and this relates to the sons of operatives in the building and wood-working trades, being the percentage of such persons who enter them. These highest percentages are printed in heavy type. It would seem that the patrimonial system (meaning here the tendency of a child to follow the father's calling) is strongly marked.

The same conclusion holds of the hatters. The families of 36 hatters were investigated, and it was found that of the 75 sons 25·3 per cent. entered the hatting industry, and 25·3 per cent. the cotton industry, while 10·6 per cent. took up clerical work, the percentages turning to other callings being invariably less than 10. No other industry in Stockport (where hat-making is localised) contributed more than 6·2 per cent. of children to the hat-industry.

¹ All the inquiries were made by Mr. Abbott.—S.J.C.

² We desire to express our obligations to the following directors of education for kindly affording facilities for the inquiry:—Mr. Whipple (Blackburn), Mr. Cowen (Manchester), Mr. Holden (Rochdale), Mr. Pickles (Burnley), Mr. Lawton (Stockport), Mr. Wilkinson (Bolton), and Mr. Kershaw (Oldham).

TABLE I.

Trade of head of family.	Number of families.	Number of male occupied children.	Percentages of male occupied children in various trades.								
			Textile.	Metal.	Building and working in wood.	Mining.*	Tradesmen.	Clerical.	Public authority.	Unskilled.	Miscellaneous. Mainly skilled or business.
Textile (mainly cotton)	538	976	61.7	8.9	3.9	—	4.7	10.4	—	4.0	4.4
Metal	387	633	33.3	33.3	4.4	—	6.5	4.8	—	4.3	5.4
Building and working in wood.....	230	400	33.5	13.5	24.2	1.2	5.2	9.5	1.0	5.0	6.7
Mining	192	424	33.2	7.5	3.0	36.0	4.5	4.0	—	5.9	5.4
Tradesmen	274	475	22.5	12.6	5.0	—	27.4	18.7	1.9	5.0	5.7
Clerical	78	114	17.5	12.2	1.7	—	3.5	49.1	—	—	14.0
Public authority	92	160	38.7	15.6	3.7	—	6.8	21.8	5.6	1.8	5.0
Agents, travellers, &c.	84	133	26.3	10.5	6.0	4.5	7.5	19.5	1.5	6.7	17.2
Unskilled	234	465	48.0	12.6	4.3	2.6	3.2	8.8	2.8	10.9	6.4
Miscellaneous trades.....	143	238	37.8	13.8	5.0	—	7.1	13.4	—	2.9	18.9
Railway	74	98	39.8	11.2	4.0	—	6.1	22.4	—	4.0	11.2
Unclassified	53	80	29.7	15.0	2.5	—	5.0	25.0	—	3.7	18.7
Total.....	2,379	4,196	40.0	14.5	6.0	4.3	7.7	13.1	1.2	5.0	8.2

* Mining is markedly localised in the area covered by the inquiry, though not quite to the same extent as hatching.

Naturally, the percentages of the rising generation contributed to different industries depend upon the relative sizes of those industries, and mainly upon their relative sizes in the locality. Our next task, therefore, was to bring our results into touch with the magnitudes of the surrounding industries, as revealed by the census of 1901,³ in cases in which it was possible to do so with least difficulty and least chance of error. In view of the census classification of trades, there was no difficulty as regards the textile, metal, and building and wood-working trades.⁴ Mining and hatting we ignored, because of the localised source of our data; and, for an allied reason, we disregarded Stockport, where hatting is localised, and Walkden, which is peculiarly a mining centre. In Tables II, III, and IV, which relate to 975 families, and 1,713 male children, we contrast for the sons of operatives in the textile (mainly cotton), iron, and building and wood-working industries respectively, the percentages entering these industries in different localities, with the percentages of occupied male adults in the same industries in the same localities. Thus in Table II, the first fraction in the first column, namely $\frac{64}{27}$, means that 27 per cent. of occupied male adults in Oldham were in the textile industries, while of the children of textile operatives in Oldham 64 per cent. entered the textile industries. In the last column the average of the ratios is given expressed as a decimal.

Ratios of percentages entering different industries to percentages of occupied adults in the same industries.

TABLE II.—*Children of operatives in the textile industries (mainly cotton).*

	Oldham.	Bolton.	Black- burn.	Burnley.	Rochdale.	Average.
Textile (mainly cot- ton)	$\frac{64}{27} = 2.37$	$\frac{78}{26} = 3$	$\frac{56}{35} = 1.6$	$\frac{66}{38} = 1.74$	$\frac{58}{27} = 2.15$	2.17
Metal	$\frac{11}{24} = .46$	$\frac{9}{17} = .53$	$\frac{3}{9} = .3$	$\frac{3}{6} = .5$	$\frac{9}{15} = .6$	.48
Building and wood- working	$\frac{4}{10} = .4$	$\frac{2}{11} = .18$	$\frac{3}{11} = .27$	$\frac{5}{9} = .55$	$\frac{4}{12} = .33$	.35

³ The required facts according to the census of 1911 have not yet been published, but it is certain that the error caused by taking the earlier census results is inappreciable.

⁴ We decided to take groups of allied trades instead of specific trades (for instance, the textile group instead of the cotton industry, the woollen industry, and so forth) because of the small numbers in some specific trades and vagueness in some of our data, as well as on account of the close connection between certain trades.

TABLE III.—*Children of operatives in the metal industries.*

	Oldham.	Bolton.	Black- burn.	Burnley.	Rochdale.	Average.
Textile (mainly cot- ton)	26 27 = .96	50 26 = 1.92	32 35 = .91	38 38 = 1	32 27 = 1.19	1.2
Metal	46 24 = 1.92	22 17 = 1.29	27 9 = 3	20 6 = 3.33	31 15 = 2.07	2.32
Building and wood- working	4 10 = .4	8 11 = .73	4 11 = .36	0 9 = 0	3 12 = .25	.35

TABLE IV.—*Children of operatives in the building and wood-working trades.*

	Oldham.	Bolton.	Black- burn.	Burnley.	Rochdale.	Average.
Textile (mainly cot- ton)	14 27 = .52	48 26 = 1.85	33 35 = .94	47 38 = 1.24	33 27 = 1.37	1.18
Metal	28 24 = 1.17	6 17 = .35	9 9 = 1	0 6 = 0	12 15 = .8	.66
Building and wood- working	41 10 = 4.1	27 11 = 2.45	21 11 = 1.91	14 9 = 1.56	17 12 = 1.42	2.29

The indices for patrimonialism, as above interpreted, are pretty much the same for the children of operatives in the textile, metal, and building and wood-working trades (namely, 2.17, 2.32 and 2.29).⁴ But the relations between the patrimonial and the non-patrimonial indices for the same trades differ greatly. Thus 2.17 (the patrimonial index for the textile industries) in relation to 1.2 and 1.18 (the non-patrimonial indices for the same industry) is small as compared with 2.29 in relation to .35 and .35 (the corresponding indices for building and wood-working). In accounting for these differences, several points will occur to the inquirer. In the first place, in view of the source of the data, a high proportion of the persons included must be youthful, and some industries absorb more young people than others. This point, however, happens to be of less importance with reference to the facts under consideration than might at first appear, since the percentages of young people in the three contrasted groups of industries in Lancashire are pretty much the same. Roughly put, for the ages 14-15, 15-20 and 20-25, they are, respectively, 4, 17 and 14 in the textile industries; 2, 17 and 15 in the metal industries; and 1.5, 14 and 12 in the building and wood-working trades. Again, all the indices, and no doubt the non-patrimonial ones in particular, vary as the rate of growth or contraction of the industries to which they relate. And again, any given industry exerts quite different attractions and repulsions on the children of parents in different industries; so that it need not occasion astonishment that 13.5 per cent. of the children of building and wood-working operatives are

⁴ See note, p. 601.

drawn into the metal industries, but only 8.9 per cent. of the children of textile operatives. In connection with this point, it is to be noted that the three trades included do not, in respect of the rank and file in them, cut across the boundaries of any "non-competing group" of labour.

Let us suppose that the effects of incidental attractions and repulsions, such as those noted above, can be eliminated by averaging. Then we have an average patrimonial index of 2.26 and an average non-patrimonial index of .7. For the sake of convenience of calculation, these may be put at 2.25 and .75 respectively. Consequently, the relative pull of the father's trade on his children, in comparison with the pull of any other given trade of about the same grade, would tend to be roughly as 3 to 1, on the assumption that all trades were of equal magnitude, and growing at the same rate.

Whether this result incorporates any serious disturbing factors or not, can be tested in one way by calculating how many groups of industries, of about the same magnitude, in competition for the rising generation of the classes investigated, are implied by our indices. Let x = the number of such groups. Then, evidently, the percentage of the rising generation who follow their fathers' trades

= $2.25 \times \frac{100}{x}$; and the percentage of the rising generation who do

not do so = $.75 \times \frac{100}{x} (x - 1)$. Consequently,

$$2.25 \times \frac{100}{x} + .75 \times \frac{100}{x} (x - 1) = 100. \quad \therefore x = 6.$$

That is to say, the indices mean that 37.5 per cent. = $\left(2.25 \times \frac{100}{6}\right)$ of the male children of people in any given industry tend to enter that industry, while 12.5 per cent. $\left(= .75 \times \frac{100}{6}\right)$ of them, or one-third of the first percentage, tend to enter each of the other five industries—and so all are absorbed since $37.5 + 5 \times 12.5 = 100$.

This implication, drawn from the averaged indices, namely, that there are about six groups of industries, of the same average size as those considered, competing in the districts examined for the rising generation dealt with, is roughly in accordance with fact. Consequently we may regard our indices as partially verified. But, again we must emphasize the sources of error which beset the inquiry, and prevent certainty as to the strength of patrimonialism from being attained; and the fact that Tables I, II, and III relate to 975 families, and 1,713 male children only.

Finally, it is to be remarked that the pull or attraction exerted by an industry, as we have called it, does not measure taste or personal inclination to enter the industry, but this in conjunction with the degree of opportunity to enter it. Fathers can naturally find places easier for their children in their own than in other trades.

Of patrimonialism among the females of the rising generation there is little to be said, since the industrial occupations open to

women are so few. The following points that arise out of our inquiries are worth recording, however. Of the wage-earning female children of operatives in the textile (mainly cotton), metal and mining industries and of railway workers and unskilled labourers, more than 80 per cent. in every case—more than 90 per cent. in two cases—are engaged in the textile (mainly cotton) industries. The highest percentage brought up to trade is found among the children of tradesmen, and the highest percentage brought up as clerks among the children of clerks.

We had thought that we might possibly be able to furnish some evidence as to upward movement in the social scale. But examination of our data revealed many ambiguous indications, and consequently led us to the view that any attempt to derive percentages of upward movement would be hazardous. However, two points of some interest in connection with this matter stood out, the one clearly and the other sufficiently to call for remark. The first is (see Table I) that most of the children of the unskilled would at least seem to be afforded opportunities of becoming skilled. One reason may be that labourers who do heavy work cannot be boys. We imagine that what is happening is that the ranks of the unskilled are being recruited mainly from the failures in the skilled trades, and particularly from the trades which make use of large supplies of boy labour. The other point relates to the degree of family movement in success in life. It was certainly suggested by the vague indications in our material that the number of brothers among those who get on is large in comparison with the number of brothers which casual selection would pick out. The cause might be similarity of stock to some extent, but the most appreciable influence is probably the efforts and ambitions of parents and the help given to other members of his family by anybody who has made a step up in life. The signs of family upward movement in our data become the more impressive when we remember that, as the data relate in the main to young people, only early successes can usually be shown.

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*Report of Departmental Commission on the Official Statistics of Canada*. 75 pp. Ottawa, 1913.

The Government of Canada, taking cognizance of the fact that, with the exception of the decennial Census, no comprehensive system exists for the collection and publication of statistics of production and distribution of Canadian commodities within the country itself, and recognising that the subject is essential to the proper appreciation of the resources, and the proper direction of the industrial trade development of the Dominion, appointed on May 30, 1912, a Departmental Commission "to inquire into the statistical work now being carried on in the various departments, as to its scope, methods, reliability, whether, and to what extent duplication occurs; and to report to the Minister of Trade and Commerce a comprehensive system of general statistics adequate to the necessities of the country and in keeping with the demands of the time." The members of the Commission were Mr. R. Grigg (Chairman), Prof. Adam Shortt, Mr. E. H. Godfrey, Mr. W. A. Warne, Mr. R. H. Coats and Mr. J. R. K. Bristol, with Mr. C. H. Payne as Secretary. The report of the Commission presents, in a clear and concise form, the salient facts of the problem which they had to consider, and states the means by which they propose to solve it. At the outset of their enquiry they constructed a diagram showing the main headings of statistical work, and the divisions in which the various branches of official statistics should be organised. The diagram no doubt represents an ideal, the realisation of which may be found difficult, if not impracticable, but, unquestionably, there is great advantage in having a conception which expresses in full measure the object in view. The Commission boldly recommend the creation of a Central Statistical Office to organise, in co-operation with the several departments concerned, the strictly statistical work undertaken by the Dominion Government. They recognise, however, that in the word "co-operation" lies the difficulty, and that it is impossible to be

very precise in defining exactly what that may imply. One sentence indicates the dilemma—"Though the office should itself constitute the main statistical agency for the Dominion, it is essential that statistics should in every case be collected and analysed by those who have a full and expert knowledge of the phenomena they illustrate." The Central Office, it is pointed out, would require to collaborate with two series of authorities, namely: (1) Departments of the Dominion Government, and (2) Departments of the several Provincial Governments. To further this essential co-operation it is suggested that an Inter-departmental Statistical Committee should be formed. This would consist of representatives of the Central Statistical Office and of other departments engaged in the collection of statistics, and its duties would be "deliberative and advisory rather than executive." This suggestion is very similar to one made by the Census Committee of this Society for the United Kingdom. The Commission in their Report review in detail the various branches of statistics required and make specific suggestions as to their scope, and in addition to the proposals above referred to they make the following recommendations for reform in existing statistics. (1) *DOMINION*: (a) *The Census*—The taking of a quinquennial Census and the limitation of the field of the Census proper and the enumeration of population and property, with a thorough re-examination of the methods at present in use in collecting and compiling data and publishing results; (b) *Production*—The institution of an annual census of production, embracing the chief products of agriculture, forestry, fisheries, mining and manufactures; (c) *Trade*—The co-ordination of the work of the statistical branches of the departments of Customs and Trade and Commerce, with improvement in the classification scheme and in other details; (d) *Transportation*—The reorganisation of canal statistics. The creation of statistics of coastal trade; (e) *Labour*—The creation of wages and consumption statistics; (f) *Emigration*—The perfecting of methods of recording departures; (g) *Miscellaneous*—Improvement in statistics of insurance and the development of price statistics; (h) *Publications*—The enlargement of the Canada Year Book. The co-ordination of other publications. (2) *PROVINCIAL*. The co-ordination of statistics on the following subjects: births, marriages and deaths; public health; education; agriculture; local and municipal governments; industrial accidents; various phases of production; finance; public lands; public works; and hospitals and charities.

It is a comprehensive, not to say ambitious, scheme, and if it is open in some degree to the criticism that it is more suggestive than actually constructive, it may at least be said that it is conceived on sound and symmetrical lines, and that if it is adopted in its entirety the Dominion will possess a statistical equipment second to none in the world. If the Dominion Government deal with the matter promptly on the lines of this Report before present systems become too much stereotyped, they will provide Canada with the machinery for recording in the best way the social and economic facts of its wonderful development.

In the appendix to the Report, a brief description is given of the statistical organisation of other countries. In the reference to the United Kingdom, statistics other than those of trade are somewhat perfunctorily dealt with, and a slight, and excusable, slip is made in stating that the census of Great Britain is under the direction of one Registrar-General. But, on the whole, the information is very carefully compiled and concisely set out. R.H.R.

2.—*Gold, prices and wages, with an examination of the quantity theory.* By J. A. Hobson. xi + 181 pp., 8vo. London: Methuen and Co., 1913. Price 3s. 6d.

A writer like Mr. Hobson, who seems instinctively to reject "authority," is a great asset to economic thought. Incapable of moving along the highway, he is continually scouting out in new directions, and presenting us with illuminating views of the economic field from fresh standpoints. The very large public that looks to Mr. Hobson for guidance in economic matters, is a proof that his observations are essentially true to life. But while pioneer work of this kind is of very great value in continually calling for the re-statement of economic propositions in accordance with changing facts, it has a special danger of its own. For new phenomena tend to assume so much importance in the eyes of the investigator that they seem to demand a fundamental revision of theory, whereas a qualification is all that is really needed. Mr. Hobson has not been entirely successful in avoiding this danger in his latest book, for while he has given an illuminating and suggestive account of the facts and conditions of the problem of prices at the present day, his re-statement of the theory of money is not free from confusion.

Mr. Hobson has realised and rightly emphasises the far-reaching economic consequences of the flood of capital which has poured out of Europe into new countries during the last decade or so. He sees in it a phenomenon which has affected the balance of economic forces throughout the world; it is obviously a factor of the first importance in determining the world's production of goods: it affects the rate of interest on capital; it has altered the relative level of wages at home and abroad; and, finally, it has extended the sphere of banking and the use of credit abroad at the same time that it has enlarged the available material basis of credit, for it has caused claims to large masses of property to be converted into the form of securities which may be pledged to the bank and become the foundation of increased supplies of credit money. But the production of goods has not gone ahead so fast as the increase of credit money. The capital invested has not yet reached its full fruition in increasing the world's supply, for much of it has been put into developmental work. Indeed, Mr. Hobson thinks that there has been an actual "retardation of supply," owing to "the vast unproductive expenditure of modern states, the increasing wastage involved in the competitive distribution of modern commerce, and last, but not least, the temporary stress which the new investment policy has laid upon those industrial operations throughout the world which conform to the so-called law of diminishing returns.

When the full fruits of the development of South America and Canada are reaped, the acceleration of the supply of goods may be found to balance or outweigh the further growth of the supply of credit, and prices may cease to rise, or even fall." Thus, to Mr. Hobson, credit and the slacking of production are the significant factors in the situation. "The counterplay of these two sets of forces, the one expanding the production of credit, the other checking the production of goods, seems to give the best explanation of the current rise of prices. The part played by the enlarged output of gold is a useful though minor one. It has facilitated the operation of the forces stimulating credit, by furnishing the larger gold reserves which, though to a diminishing extent, are still required to maintain the easy currency of credit-notes. It is a condition, but not a chief efficient cause of the acceleration of supply of credit." If Mr. Hobson had had no more to say about gold than this last sentence, there would have been small reason to cavil at his monetary theory. But he has gone farther and given an exposition of his version of the way in which the level of prices is determined, in the course of which the part played by gold is almost entirely ignored, and the whole stress laid on credit money and its increase. It is not possible here to follow out this exposition in detail; it will, perhaps, suffice to mention one or two of the more important points that call for criticism. At the outset, it is surely courting disaster to expound the money side of the equation of prices by saying that the bulk of money available in a year is due to receipts from goods sold, and that the "quantity of money" is equal to the gross incomes of the aggregate of individuals. This, of course, would be merely axiomatic if we allowed Mr. Hobson to mean by "quantity of money" the *total value of the monetary units exchanged during a year!* But this gross receipts figure results from a combination of "quantity of money" and "value of money." Mr. Hobson goes on: "Recognising that the normal direct source of money at any time is payments for goods, it will rightly be presumed that the quantity of money should have a close relation to the quantity of goods. . . . Most changes in the quantity of money are directly connected with and proceed from changes in the quantity of goods and transactions." Here, again, there is confusion between quantity and value both in the case of goods and in the case of monetary units—a confusion which completely reveals itself in the following statement:—"If all money were thus derived from prior acts of sale, the aggregate receipts rising and falling with the expansion or shrinkage of those acts of sale, it would appear as if quantity of money must vary directly and proportionately with quantity of goods, and that therefore prices must remain stable." But clearly it is possible for the aggregate value of purchases in a year to remain unchanged, and yet for prices to fall through an increase in the number of units of commodity. A manufacturer, A, receives his income from the sale of goods, but when he goes to spend it he finds that B, a farmer, has had a smaller crop than before, and though the "quantity of money" in Mr. Hobson's sense would be unchanged, average prices would rise. Throughout the chapter on the "Price Problem," Mr. Hobson never seems to appreciate that the question

to be determined is the ratio between the value of the currency unit and the value of a unit of commodity. Among other points calling for criticism may be mentioned the assumption that the expansion of credit is limited, not by considerations as to the available gold reserve, but by the quantity of property in the form of securities; the failure fully to appreciate the fact that whatever the effect of credit may be in circles where credit is in use, a rise of prices that affects retail prices requires an expansion of metallic currency; and finally protest must be made against the assertion that those who hold orthodox views on money believe that the quantity of gold output is the *sole* ultimate regulator of prices upon the money side of the equation of exchange. The ratio of the gold basis to the credit erected upon it changes as business methods evolve—a fact adequately emphasised twenty years ago in Dr. Marshall's evidence before the Gold and Silver Commission. Mr. Hobson's task should have been to show what changes have occurred in business methods which have made it possible to enlarge the amount of credit built on a given gold reserve while fully maintaining the parity between a unit of credit currency and a unit of gold currency, rather than to show merely that the amount of paper securities in the world has increased.

The chapter on Distribution is admirable and all too short. Perhaps Mr. Hobson will be able to develop this section of his work. His views on the slow return to developmental capital must necessarily be, in the absence of adequate data, a matter of opinion.

W.T.L.

3.—*Études sur la Formation et le Mouvement des Prix.* Par Marcel Lenoir, Ancien élève de l'École polytechnique, docteur en droit. 201 pp., 8vo. Paris: M. Giard et E. Brière, 1913.

M. Lenoir has published under one cover what are in effect two separate and distinct treatises, the one dealing with the theory of price and its determination by the interplay of demand and supply, and the other containing an examination of price movements over a long period of years of certain important commodities. The former is treated in a highly abstract manner with the aid of indifference curves, "satiety" curves and other graphical devices, some of which vie with Chinese puzzles in complexity; while the latter consists of an examination of a number of price charts. In a half-apologetic manner, the author in his preface touches upon this dual character of the book: "Ces deux séries de recherches correspondent à deux aspects distincts sous lesquels on peut envisager les prix, l'un statique, l'autre dynamique. On souhaiterait, sans doute, d'éclairer ces deux aspects d'une même lumière: une méthode parfaitement adaptée à son objet ne devrait-elle pas pouvoir s'appliquer également à ses différents modes? Mais une pareille unité ne paraît point encore réalisable, le plus souvent, dans le domaine économique." That there must be such differences of method is indeed inevitable; but it may be doubted whether M. Lenoir was well-advised to combine rather extreme examples of realistic and analytical study in a single book, for it is to be feared that many readers will be frightened away by the forbidding

technicalities of part 1 who would have found the discussion of the facts in part 2 intelligible and very suggestive. For such readers little would have been lost by the omission of the first half-dozen chapters, for the only conclusions that are carried forward for statistical verification are a few elementary theorems which might almost have been taken as axiomatic, or at all events could have been shortly proved in simple language. It does not require, for example, any very elaborate analysis to prove that if prices vary in the same direction as production we have probably to seek an explanation of the change on the side of demand, but if they vary in contrary directions we have probably to find the explanation on the side of supply.

The statistical section of the book deals with coal, wheat, cotton, coffee, and average prices over periods of from eighty to a hundred years. Figures of production and consumption both in France and in world markets are presented and an examination is made of the relation between price changes of important commodities and the cyclical variations of trade. The connection between prices and production is brought out by charts in which oscillations are shown by comparing the figures for each year with nine year averages. The results for coal and wheat show that whereas in the former case the special annual movements of prices and production vary in the same direction and closely follow the general state of trade, the prices of wheat as a rule vary inversely with production, and moreover do not touch maxima and minima at the same time as general trade conditions. In comparatively short periods, coal prices and production are the consequence of the state of trade, and in fact are a good index of industrial conditions; wheat prices on the other hand depend on the crops; supply is the predominant factor, and at all events in the latter part of last century the price of wheat has not shown a close correlation with the general condition of industry. On the question of the correlation of general prices with gold production M. Lenoir relies on the calculation of M. Anquetin, which he has brought up to date, as to the amount of gold required to keep prices at a constant level. The deficit or excess of annual production compared with this standard shows a fairly close correlation with the movement of the general price level. It will be remembered that a similar calculation by M. Cassel was quoted by Mr. Hooker in his Paper on prices in the *Journal* for December, 1911. The author does not claim to have broken new ground. The existence of economic laws, he tells us, the universality of trade cycles, the influence of harvests, the quantitative theory, all would be revealed by a simple observation of the facts. But a more exact verification is of value. The merit of this book is that it shows how such a task is to be attempted.

W.T.L.

4.—*Histoire Financière et Économique de l'Angleterre* (1066-1902). Par Étienne Martin. Tome Premier. xii + 512 pp. Tome Second. 642 pp., Svo. Paris: Felix Alcan, 1912. Price 20 francs.

The learned author of this important treatise has already demonstrated his competence to deal with questions of English financial practice in his book, published some eight years ago, on

the direct taxes of this country. He has, we think, been no less successful in showing a full and accurate knowledge of the detailed facts, and an ability to seize and present the outstanding events and movements, of the past financial history of England generally in the two large volumes now before us. To the more considerable achievement thus accomplished he has brought, as it seems to us, the admirable qualities of clear arrangement of his material, of interesting narration of the story, and of sober, comprehensive judgment of its significance. He has, too, we believe, woven into his special theme the correct amount of that general economic history which is, as he rightly holds, necessary to the intelligent interpretation of the successive chapters of his narrative. And, while the book has for English readers the advantage of the detached opinions of a foreigner observing from outside, the author has been so painstaking in acquainting himself with recorded facts as given in the best authorities, whether these consist of the original documentary evidence, to which he refers specially in his bibliography, or of histories of repute, that he can justly be pronounced to have steeped himself in an English atmosphere, and to have avoided the errors of detail or—what is perhaps yet more fatal—of proportion into which a stranger is so liable to fall unwittingly, with the most unimpeachable intention to walk aright. The usefulness of his book for students on this side of the Channel is, we may observe, enhanced by the circumstance, to which he alludes, that the most authoritative work of reference on the subject written hitherto in English—Dowell's *History of Taxation and Taxes in England*—is out of print, and was published almost a generation ago.

From one standpoint also a feature of the present treatise, which might perhaps receive and earn some criticism, may be welcome to not a few of those who peruse its pages. The introduction, in which the history of French finance is sketched from the beginning until and including the fiscal arrangements of the *ancien régime*, might appear superfluous in a history duly circumscribed as appropriate to England alone; but it enables M. Martin to draw, at the end of his account of English developments, some interesting and instructive comparisons with the different course pursued in his own country. Englishmen will be the more ready to excuse this interpolation, if such it be, because our author delivers a verdict favourable to the results which have accrued to us as contrasted with the French. If he betrays a bias, indeed, it is of appreciation of the general character of the existing fiscal system we enjoy, although he discerns some signs of impending change in the present comparative simplicity, for example, of our customs tariff.

His treatment is divided into three main periods, following the introduction, to which reference has been already made. The first embraces the long stretch of time from Magna Carta to the Revolution of 1688, the second extends from the latter date to the Reform Bill of 1832, and the third, beginning with 1832, covers the seventy succeeding years until 1902. In the first volume, which is wholly devoted to the first of these three periods, in successive chapters the general social and political condition of the country

is sketched before the nature of the taxing system is examined ; and the position following the Norman Conquest, the Hundred Years' War, the Tudors, the Stuarts and the Civil War, and the Restoration, supply convenient headings for the narrative. In the second volume the question of the debt comes into prominence during the second period, and in the third and last period considerable space is necessarily given to the income tax. In his concluding *résumé*, which is appended to the historical discussion, M. Martin states and develops the significance of two main inferences, which are, he thinks, established. The first is that in England, unlike France, taxation has not been raised on the sole authority of the reigning sovereign, but has always had the assent of the taxed, or of their representatives in Parliament ; while the second is that the English Government has never—since 1688 at least—repudiated or reduced arbitrarily any of the debts which it has contracted. Accordingly its credit has remained unimpaired even at critical moments in its history.

L.L.P.

5.—*Histoire de l'Impôt depuis l'Antiquité jusqu'à nos Jours*. Par A. Wagner et H. Deite. Traduction Française. Vol. I, x + 327 pp. Vol. II, 371 pp., 8vo. Paris: M. Giard et É. Brière, 1913. Price 24 francs.

English students, who, finding a difficulty in understanding German, can nevertheless read French, will accord a grateful welcome to this opportune translation of the second edition of the third part of Professor Wagner's well-known *Finanzwissenschaft*. For it represents the portion of that magisterial work which is not the least valuable for the information and direction of willing pupils belonging to other nations. In the hands of so able and erudite an authority as the veteran German economist the "aperçus" of the financial history of different countries, with which the fuller accounts of the fiscal system of his own are supplemented and completed, could not fail to be illuminating ; and the careful comprehensive judgments passed in the conspectus, added to each of the two main periods into which the survey is divided, win our respectful admiration, if they do not command our unreserved assent, for their firm grasp of the essential characteristics, for their apt selection of the main similarities and differences, and for their combined sanity, lucidity and directness. We are sensible, as we should be, that the suggestion and the guidance which are offered are those of a veritable "master." In the preparation of the German edition, from which the version before us has been made, Professor Wagner received, as he informs his readers, the competent assistance of Dr. Deite, with the result that the later history was brought more closely up to date, and the earlier received numerous additions and corrections, particularly in the very useful department of bibliographical reference. But this collaboration, to which Professor Wagner pays the generous tribute which is deserved, was consistent with independent fresh contributions from his own single pen ; and it is interesting and significant to note his personal satisfaction that recent fiscal developments, especially in

England, have confirmed his previous view, that to complete, and compensate for, the effects of the indirect taxation of commodities, which was still growing in spite of the great height it had already reached, it was necessary to develop and extend the system of direct taxation, in the shape of income tax, of death duties, and also of "les plus-values." The present translation, for the first volume of which M. Bouhé-Leclercq, and for the second Dr. Couzinet, have been responsible, appears to have been carefully and skilfully executed.

This history of taxation, then, which, with its emendations and enlargement, may, in the author's words, be said to have become, in a measure, a work entirely independent of the treatise of which it was originally a part, is divided into two main periods. In the first volume the review of the outstanding features, and the salient moulding forces, begins with the ancient classical world of Greece and Rome, and, passing through the Middle Ages, ends with 1815. In the second and concluding volume the century from 1815 to 1910 is similarly surveyed. To the financial and fiscal system of his own country from the ninth to the close of the eighteenth century the learned author devotes three sections covering a hundred and twenty pages, and to this succeed two sections, dealing respectively with France and with England. In the second volume, in which the later history is handled, other countries, such as Austria, Russia and Italy, are brought under consideration; and, while the detailed method of treatment is broadly similar, some general classifications are opportunely introduced. The very important and difficult question of the fiscal treatment of the component units of federal unions necessarily arises in contrast with the methods possible or desirable in unitary states, and the American and Swiss republics receive, as they require, notice in this connection in addition to the German Empire itself. At the close of either volume certain conclusions are drawn, which appear to be justified by the historical conspectus; and, at the end of the second volume, for example, it is shown that experience has proved the need and advantage of reaching the masses by the effective instrument, in the main, of the taxation of articles of general consumption, while the classes above them should be hit more severely through direct taxation, and that fiscal expediency and economic necessity alike dictate the advisability of the collection of a very considerable revenue by the latter means from the most wealthy strata of the community. L.L.P.

6.—*Die grosstädtischen Agglomerationen des Deutschen Reichs, 1871-1910.* Von Professor Dr. Sigmund Schott. 130 pp., 8vo. Breslau: W. G. Korn, 1912.

Die Bevölkerungsbewegung der deutschen Grossstädte seit der Gründung des Deutschen Reiches. Von Dr. oec. publ. Pankraz Dittman. 153 pp. and 71 Tables, 8vo. Bamberg: S. Mahlmeister, 1912.

In the former of these two discussions of the statistics of the great towns of Germany, the growth of the great population aggregates is treated in the manner made familiar in the various issues of the *Statistisches Jahrbuch Deutscher Städte*. The nuclei of

these aggregates and the territory surrounding them are both examined, the difficulties presented by the varying extent of municipal areas in different cases being thus met. In 1871 there were only 8 cities and towns in the German Empire whose population exceeded 100,000. At the Census of 1910 the number had grown to 48. The original 8 had, in 1871, a population of just over 2 millions, which had grown to 6 millions in 1910. The population in 1871 of the towns which had over 100,000 inhabitants in 1910 was about 4 millions, while these 48 towns had a population of 13,800,000 in 1910. From 4.94 per cent. of the population of the Empire in great towns in 1871 the progressive urbanisation is shown by the growth to 21.29 per cent. in the towns which were classed as great towns in 1910. Considering the population of the areas within a radius of 10 kilometres of the centres of the great towns, the original eight aggregates had a population of somewhat over $2\frac{1}{2}$ millions in 1871, and the 37 aggregates which included in 1910 the 48 municipal areas of over 100,000 inhabitants, each then counted a total population of 18 millions. The growth of population on the territory inhabited by these 18 millions had been about three-fold in the forty years, a rate of increase only slightly less than that of the eight original great urban aggregates.

In addition to bringing together the details for each of the towns concerned, Dr. Schott presents a study of the depopulation of the business centres which has accompanied the growth in the numbers of the urban aggregate in certain cases.

Dr. Dittman is concerned to study, not the aggregate numbers inhabiting the great towns of Germany, but the data showing the variations in births and deaths in these towns, giving attention also to the variations in illegitimate births, in infantile mortality and in mortality from tuberculosis. He endeavours to trace general relations between density of population, decrease of birth-rate, decrease of tuberculosis mortality, &c. The figures are not grouped in large masses, as in Dr. Schott's study, but in the main presented for the several towns separately. The mass of material is somewhat undigested, but a number of interesting points find illustration in the comparisons which the author has made. Data are also included for certain great towns of the leading countries of the world. It is to be observed, however, that the inclusion of still-births in the data of births and deaths in some cases, their exclusion in others, introduces an element of uncertainty in comparisons of which adequate warning is not given.

A.W.F.

7.—*Krankheit und Soziale Lage*. Herausgegeben von Prof. Dr. M. Mosse und Dr. med. G. Tugendreich. 1 Lieferung. 232 pp., 8vo. München: J. F. Lehmann, 1912. Price 6 marks.

The science of hygiene affords ample opportunities for the co-operation of different types of intellect. The clinician observes the manifestations of disease in various types of the population, and the concurrence of certain maladies with certain conditions of life and labour; the statistician is called upon to determine the degree of significance attaching to the massed observations, and the

experimenter attempts to isolate from the multitude of possibly operating factors those of essential importance. Finally, the results attained having been rendered clear, the scientific statesman must give them appropriate legislative expression.

The subject being so vast and many-sided, it is impossible for anyone to keep in touch with all its recent developments without the aid of compilations summarising the conclusions of different specialists. The volume before us is the first part of such a work, undertaken by various German authors under the editorial supervision of Professor Mosse and Dr. Tugendreich.

The work opens with a general introduction by the editors in which the history of opinion respecting the influence of social conditions upon morbidity and mortality is sketched, the vexed questions associated with the application of the Darwinian principles to man briefly, but temperately, considered, and the fallacies of interpretation which beset the whole subject plainly set out. This introduction will commend itself to all impartial readers. The following article, by Professor Silbergleit, is a useful introduction to the classification of deaths and diseases employed in German official statistics, and will be of special value to lay readers. The next article is a study of the dwelling, in its relation to disease and mortality, by Dr. Wernicke. The general hygienic principles involved are discussed and illustrated, and the relations of certain diseases, particularly tuberculosis, with housing conditions are considered at length from the statistical standpoint. We think it probable that the interpretation of these statistics is more dubious than the author suggests, but the utility of the compilation cannot be doubted. Professor Hirschfeld discusses the influence of food upon morbidity and mortality, and his article brings together the results of many inquiries into the nourishment of different classes of the population. This article is calculated to correct some popular misapprehensions. Thus, it is pointed out that in prisons the rate of mortality has diminished greatly in recent years, and that in particular certain diseases, such as scurvy and a particular form of dropsy, "Prison Oedema," have practically disappeared, notwithstanding the fact that the protein content of the diet is markedly less than the amount at one time declared by Voit to be the minimum permissible.

The last article in the volume, by Dr. Koelsch, deals with the influence of occupation upon morbidity and mortality, and follows the lines of the other contributions. After a consideration of general principles, the occupational incidence of certain important diseases is examined statistically, a comparison between the sexes is instituted, and, finally, each occupational group is separately characterised. In the section dealing with female labour, many remarkable facts are brought out. Thus, according to Falk, whose results agree, where comparison is possible, with those of Strassmann, 15·7 per cent. of sewing-machine workers suffer from anomalies of menstruation against 3·5 per cent. among hand sewers. The general morbidity figures for the sexes are of interest. Thus, according to the experience of the Frankfurt Ortskrankenkasse,

the numbers of illnesses (exclusive of births) per hundred members were :—

Age-group.	Males.	Females.	Age-group.	Males.	Females.
15—20	101.7	115.8	40—50 ...	112.3	108.1
20—30	101.7	120.5	50—60	130.3	124.4
30—40	103.5	129.4	Over 60	121.9	93.3

We think, on the whole, that this volume fulfils excellently the purpose with which it was undertaken, and if the succeeding parts attain the same standard, the work will form a valuable addition to the library of any student of hygiene and preventive medicine.

M.G.

8.—Other New Publications.*

Bluekey (L. S.). The sale of liquor in the South. History of development of a normal social restraint in Southern Commonwealths. Columbia University Studies. Vol. 51, No. 127. 56 pp., 4to. New York: Columbia University, 1912. Price 4s. net.

[In the author's opinion the prohibition movement in the Southern States of the Union is a response to a fundamental social impulse, the sale of intoxicants having become a depressing social influence no longer to be countenanced by public opinion.]

Davis (H. H.). The Civil War and reconstruction in Florida. Columbia University Studies. Vol. 53, No. 131. xxvi+769 pp., 8vo. New York: Columbia University, 1913. Price 16s. net.

Effertz (O.). Le Principe Ponophysiocratique et son application à la question sociale. Leçon d'Ouverture faite à la Faculté de droit de l'Université de Paris. 65 pp., sm. 8vo. Paris: Marcel Rivière and Co., 1913. Price 6 fr. 75.

Elbrow (Engineer Rear-Admiral G.). The New English System of Money, Weights and Measures, and of Arithmetic. 40 pp., sm. 8vo. London: P. S. King and Son, 1913. Price 1s. net.

[The author advocates a duodenal system in preference to a decimal system.]

Ferraris (Carlo F.). Inscritti nel diciannovenno scolastico dal 1893-94 al 1911-12, e Laureati e Diplomatici nel settenno scolastico dal 1904-05 al 1910-11, nelle Università e negli Istituti superiori italiani. 15 pp., 8vo. Torino: Società Tipografico-Editrice Nazionale, 1913.

— — Statistica ed Elenco dei Soci stranieri della Reale Accademia dei Lincei dal 1873 al 1912 distinti per Nazionalità. 19 pp., 8vo. Roma: Tipografia della R. Accademia dei Lincei, 1913.

[A statistical analysis of the numbers of foreign members of the Royal Academy of the "Lincei" during the period 1873-1912, arranged according to nationality and the subject of study.]

* See also "Additions to the Library," page 630, *sqq.*

Henningsen (Dr. Adolf). Die gleitende Skala für Getreidezölle. xiv + 116 pp., la. 8vo. Jena: Gustav Fischer, 1912. Price 5 m. 50 pf.

[An economic and statistical study of the working and influences of sliding scales in the imposition of duties on corn, on prices of corn and agriculture generally. The book deals with the working of these scales in England from the time of their introduction in the reign of Charles II, to their abolition in the time of George III. The question of their applicability to German import duties is also discussed.]

Jaeckel (Dr. Reinhold). Die Selbstmorde im Kreise Teltow, 1810-1910. 26 pp., fol. Berlin: W. Koebke, 1912.

Mayr (Dr. Georg von). Statistik und Gesellschaftslehre. Band 3. Sozialstatistik. (Moralstatistik, Bildungsstatistik, Wirtschaftsstatistik, Politische Statistik.) Teil 1. Moralstatistik. Lieferung 4. 82 pp., 8vo. Tübingen: J. C. B. Mohr, 1913.

[This section of Dr. von Mayr's book deals with the statistics of crime and their interpretation as shown by the different criminal returns of the German Empire over a series of years.]

Methorst (H. H.). Nederlandsche Bevolkingsstatistiek. II. (Overdruk uit De Economist. Jaargang 1913.) 2 parts, 8vo. The Hague, 1913.

[A short study of the vital statistics of Holland over a series of years compared with those of other countries.]

——— Zuigelingensterfte in Nederland in Verband met de Uitkomsten van het Haagsche Onderzoek 1908-09. 20 pp., 8vo. The Hague, 1913.

[A study of infantile mortality in Holland in the country as a whole, and in large and smaller towns over a series of years.]

Morse (H. B.). Trade and Administration of China. Revised edition. viii + 466 pp., 8vo. London: Longmans, Green and Co., 1913. Price 10s. 6d. net.

[The first edition of this book was reviewed in the *Journal* for September, 1908. The present edition has been revised, and the statistics brought up to date. The author remarks that, despite recent political changes, "China remains unchanged, and a knowledge of the China of the past is as necessary as ever to the understanding of the China of the future."]

Munsterberg (Hugo). Psychology and Industrial Efficiency. 320 pp., 8vo. London: Constable and Co., 1913. Price 6s.

[This book (which is an adaptation, though not a translation, of a work on the same subject written by the author in German) deals with the means of obtaining the best application of effort to industrial purposes, and its effects in reducing cost of production.]

Robinson (E. F.). Cost of Government in Minnesota: being chapter xv of Third Biennial Report of Minnesota Tax Commission, 1912. 343 pp., 8vo. St. Paul, 1912.

[The Minnesota Tax Commission made the first study of the cost of government in their State in 1910. In view of the interest which it aroused, the Commission resolved to continue the investigation, and increase its scope in 1912. The study is especially opportune in view of the agitation over the high cost of living, and the disposition in certain quarters to ascribe it to excessive taxation.]

Robinson (E. V.). Railroad Taxation in Minnesota. Analysis of the Gross Earnings Tax: being chapter xiv of Third Biennial Report of Minnesota Tax Commission. 58 pp., 8vo. St. Paul, 1912.

[Deals with methods of taxation in general, and the development of railway taxation in the United States. The experience of certain of the States is examined, and the author ventures the opinion that the system at present in force in Minnesota, namely, the gross earnings tax on railroads, is generally the most just system yet devised.]

Samuel (Horace B.). The Land and yourself. A popular discussion of the Land question and of the proposals advanced for its solution. xi + 115 pp., 8vo. London: T. Murby and Co., 1913. Price 1s. net.

[A short history of the land question and an analysis of suggested reforms, viewed in the light of the experience of some other countries. The single tax is discussed, and the use and meaning of rates and taxes as applied to land are briefly explained. There is also a chapter on small holdings.]

Sigerus (A.). Handelsbetriebsstatistik mit besonderer Berücksichtigung der Warenhandelsbetriebe. Ergänzungshefte zum Deutschen Statistischen Zentralblatt. Heft 2. 82 pp., 8vo. Leipzig: B. G. Teubner, 1913. Price 3 m. 60 pf.

[A study of commercial statistics based on the German Industrial Census of 1907.]

Silbergleit (Prof. Dr. H.). Statistische Beiträge zur Frage der Lebensmittelversorgung in deutschen Grosstädten. Bericht an den Vorstand des Deutschen Städtetages in Auftrage seiner Kommission. 75 pp., 8vo. Berlin, 1912.

[A statistical inquiry into the food supply of large German towns during recent years. Statistics are given of the quantities consumed, and wholesale and retail prices of different kinds of meat in some thirty odd towns during 1907-12. Some information is also given as to the consumption and prices of fish and potatoes.]

Vincey (Paul). Le prix de la viande à Paris. 151 pp., 4to. Paris: H. Dunod and E. Pinab, 1912. Price 6s. 6d.

[This work deals with the causes which have led to the present high prices, and contains certain suggestions for their reduction. The present high cost of living, the author remarks, is due partly to the high price of bread and meat, but whereas the price of bread has a tendency to fall following the harvest of 1912, that of meat shows no such sign.]

Cancer Mortality Statistics of England and Wales, 1851-1910. With map and diagrams. 24 pp., 8vo. London: Society for the Prevention and Relief of Cancer, 1913. Price 6d.

[The object of this pamphlet is to furnish, in simple form, the essential statistical factors of the cancer problem as it affects the various parts of England and Wales.]

Problems in Eugenics. Vol. 2. Report of Proceedings of First International Eugenics Congress, London, July 24-30, 1912, with an Appendix containing those Papers communicated to the Congress not included in Vol. 1. 8vo. London: Eugenics Education Society, 1913. Price 3s. 6d.

[This volume contains an account of the proceedings of the different sections of the Eugenics Congress at its meeting last year, and also the following Papers which were not in time to be included in the first volume:—The Contributions of Demography to Eugenics, by Dr. C. Gini. Effect of Alcoholism on the Germ-Plasm, by Dr. J. A. Mjöen, and Neo-Malthusianism and Race Hygiene, by Prof. A. Ploetz.]

CORRESPONDENCE.

VARIABILITY AND MUTABILITY.¹

To the President of the Royal Statistical Society.

SIR,—A copy of the February number of the Journal of your Society sent to me here, either by the Society itself, or by some courteous member of the same, called my attention to a review (pages 326 and 327) of my article "Variability and Mutability," which I cannot allow to pass in silence. The reviewer raises some objections to the indices suggested by me, which would obviously have occurred to anyone reading only fragments of the book, but which, on account of their obviousness, I have taken into ample consideration.

I shall, therefore, be grateful to you and to the distinguished Society over which you preside, if you will grant me in your Journal the hospitality of a few lines of your space to sum up briefly the arguments of my work, and to show the precise points where your reviewer, if he had read carefully, could have found the replies to the objections which have occurred to him.

My essay is divided into three parts. In the first (Introduction) there is an examination of the relations between the qualitative modality and the quantitative modality of phenomena, showing (pages 3 to 12) how in many cases it is difficult to trace a clear division between the two categories, but how, on the other hand, the qualitative modalities of a phenomenon represent something psychologically distinct from the quantitative modalities, even when (for example in the colours of the rainbow, and in eye and hair colour) these depend on the quantitative modalities of other phenomena (*i.e.*, on the wave length of the rays and respectively on the amount of pigment) (compare pages 4 and 5). In other cases, on the contrary, the distinction is clear. No one, for instance, would ever think of reducing to quantitative form the modality of sex, of civil status or of race (pages 3 and 4). I term "variability" the tendency of a character to assume different quantitative modalities, and "mutability" the tendency to assume different qualitative modalities. Your reviewer considers that such a distinction is unnecessary and undesirable, since in each case the same phenomenon is being described, and I have certainly no intention of discussing this matter with him here; I will only observe that he does not seem to be aware that such a distinction, in my work, forms the conclusion of an analysis of several pages (pages 3 to 15).

The following part (Indices of Variability) is intended to show

¹ This letter has been translated from the Italian, and was referred to the Editors by the President, to whom the letter was addressed.

how the indices which measure the variability of quantitative characters by taking the mean of the deviations from the mean intensity or median intensity of the characters, only correspond to the object of the investigation in certain cases, but how in other cases, perhaps more frequent, an index derived from the mean of the differences between the intensities of the character observed is more suitable. For such a mean difference simple formulæ are given, and it is shown how (except in special cases) it does not remain in constant relation with the mean deviation nor with the root-mean-square-deviation from the mean. This part of my work is not criticised by your reviewer, but it is referred to in such a way as to render my idea unrecognisable. Anyone can convince himself of this by examining the first paragraph of the review, and comparing it especially with pages 17 to 20, 49, 80 to 99 of my work.

The last part of my book (*Indices of Mutability*) proposes to establish—I believe for the first time—formulæ for the measurement of the mutability of qualitative characters, analogous to those to be used for the variability of quantitative characters. It is said repeatedly and explicitly that such formulæ are established for some theoretical schemes and types, which are not likely to be found strictly corresponding with the reality, but according to which an approximate treatment may be given of the series of qualitative characters (compare especially pages 114, 130—132, 149—150). Three fundamental types of series are distinguished—rectilinear, cyclical, and unconnected—of each of which an example is given, noting the cases where the example dealt with does not fully correspond to the theoretical scheme (compare pages 130 to 132, 149 and 150). Again, the limits within which the results thus obtained are comparable are clearly fixed (compare pages 120 and 121).

I cannot help thinking that your reviewer has not read with attention the pages 9, 121 and 130—132 of my work, because otherwise he would have perceived that his observations with respect to the correspondence of the index of mutability for rectilinear series with the index of variability for quantitative characters, to the arbitrary nature of the limits between the different hair and eye colours, to the gradations appearing in the same colour of the eyes or of the hair, had been already made in my work, and he would have then felt the need—I have no doubt—of referring to this in his review. As to the idea of making the terms of an arithmetical progression correspond with the qualitative modalities of a character, which would constitute, according to your reviewer, the least satisfactory feature of my book, he could have learned from the note on pages 121 and 122 that the idea is not at all new but has been largely used in the *Anthropometry* by Ammon, by Livi (latterly by Retzius), and in substance first of all by Beddoe, precisely for the very characters for which I have used it, and it was afterwards used in the official agrarian statistics of five European States. This wide and persistent use should prove that the proceeding has some value; if your reviewer has anything better to propose, which would serve for the same purpose, it will certainly be meritorious of him to produce it.

The final criticism made by your reviewer is that I have not taken into account the fact that statistics do not deal with all the ascertained cases, but only with random samples of them. But it is easy to ascertain by reading pages 37—44, 127, 138, 146, whether for each of the indices proposed—the indices of variability or those of mutability—there is to be found in my book a special paragraph intended precisely to examine the influence of random sampling on the value of the index. On pages 44—46 it is pointed out that the aim of the research may be directed to the measurement of the variability of the observed cases only, or that of all the cases verified (or ideally possible), of the phenomenon from among which the cases observed have been selected. On page 19 (text and note), and on pages 58 and 59 (note), the difference is noted between the probable errors of the mean deviation, the root-mean-square-deviation from the mean, and the average difference, in cases in which the distribution follows the Gaussian curve, and on pages 86 and 87, the intensity of such probable error is assumed as the criterion of selection between those indices in certain researches. The probable errors of the indices of mutability have not yet been determined; they can be determined in the future. But this need not hinder the use of these indices in the meantime, it being understood that some caution must be used. If, to make use of an index, statisticians were obliged to wait until they could ascertain its probable errors, almost all their theories would have remained without application for a long time, and even now a great proportion of them would only be applied to particular cases. As to the application made by me of the index of mutability to the colour of the eyes or of the hair, these indices refer to a number of cases so large that, whatever probable errors of the indices may be, the conclusions would certainly not be weakened; and as to the marriages in Cremona, Madrid or Berlin (apart from the question whether the number of cases observed may be called small or large, and whether in this case we may properly speak of random samples), the indices give in any case, for the three cities, results which I have already considered almost identical (page 137). On this point, also, your reviewer does not say anything in contradiction to my conclusions, when he throws doubts whether the slight differences between these results were significant.

Your reviewer finally remarks that some of the indices of variability employed by me are merely alternative to the "standard deviation," and that the indices offer nothing of great interest for the statistician who proceeds systematically with the method of moments. With respect to both points it appears to me that something more may be said; one of the indices used by me is precisely the "standard deviation," which in Italian is called "*scostamento quadratico medio*,"² and as to the interest of my enquiries, they cannot be of much interest to those whose system it is to proceed always with a given method (whether one of moments

² For the relations of the standard deviation and of the mean deviation with the mean difference, compare pages 33—35 and 49—53.

or any other) independently of the scope of the enquiry, because my investigations are founded on the idea, fundamentally different, that the criterion of selection of the statistical indices is to be found above all in their correspondence with the object of the enquiry, and only in a subordinate degree in their own formal properties (compare pages 17—20 and 86—99).

I beg to thank you, and through you the Royal Statistical Society, for your kindness in opening your columns to me.

I am, Sir, &c.,

CORRADO GINI,

Professor of Statistics
at the Royal University of Cagliari.

March 25, 1913.

[The above letter has been submitted to the reviewer, who regrets that he should have put Professor Gini to the trouble of a reply, but sees nothing in the letter to cause him to alter the opinions expressed in the review. In the case of such classifications as those of hair-colour, he holds, a quantitative scale underlies the qualitative classification, and the introduction of a special term like "mutability" to express the scatter or dispersion in these cases is undesirable. The nine pages devoted by Professor Gini to the discussion of the difficulties in drawing a clear line of demarcation between "qualitative and quantitative modalities of phenomena" seemed to him to support this view. The particular term *mutability* suffers from the disadvantage that *mutation* in biology has for some time been employed to express *discontinuous variation* only. As regards the formulæ suggested by Professor Gini, he recognised that the idea was not new, but with all respect to the eminent anthropologists cited is unwilling to regard them as authorities on statistical method, and, in reply to the invitation to produce something better, he would refer to the method used in the pages of *Biometrika*. He begs to assure Professor Gini that his remarks were not made in any captious spirit. The book was carefully read, and the disagreement as to certain of the methods employed appears to be fundamental, and cannot be explained away by suggestions of superficial perusal.]

CURRENT NOTES.

The trade returns continue to show an increase in the value of both imports and exports. The subjoined tables compare the returns of the twelve months ending April, 1913, with the twelve months ending April, 1912:—

[000's omitted.]

Imports.	Twelve months ending April, 1913.	Twelve months ending April, 1912.	Increase (+).
Imports, value c.i.f.—	£	£	£
I. Food, drink and tobacco	283,044,	265,956,	+ 17,088,
II. Raw materials and articles mainly unmanufactured	273,548,	253,612,	+ 19,936,
III. Articles wholly or mainly manufactured	187,923,	166,611,	+ 21,312,
IV. Miscellaneous and unclassified (including parcel post)	2,932,	2,533,	+ 399,
Total merchandise.....	747,447,	688,712,	+ 58,735,
Imports of bullion and specie	72,133,	63,149,	+ 8,984,

[000's omitted.]

Exports.	Twelve months ending April, 1913.	Twelve months ending April, 1912.	Increase (+).
Exports of produce and manufactures of the United Kingdom, value f.o.b.—	£	£	£
I. Food, drink and tobacco	32,458,	29,774,	+ 2,684,
II. Raw materials and articles mainly unmanufactured	63,104,	52,052,	+ 11,052,
III. Articles wholly or mainly manufactured	391,932,	360,301,	+ 31,631,
IV. Miscellaneous and unclassified (including parcel post)	10,105,	9,187,	+ 918,
Exports of foreign and colonial merchandise, value f.o.b.—			
I. Food, drink and tobacco	15,124,	14,610,	+ 514,
II. Raw materials and articles mainly unmanufactured	67,290,	60,059,	+ 7,231,
III. Articles wholly or mainly manufactured	29,233,	28,529,	+ 704,
IV. Miscellaneous and unclassified (including parcel post)	164,	157,	+ 7,
Total, British, foreign and colonial	609,410,	554,669,	+ 54,741,
Exports of bullion and specie	64,864,	56,321,	+ 8,543,

[000's omitted.]

Shipping.	Twelve months ending April, 1913.	Twelve months ending April, 1912.	Increase (+).
Total, British and foreign, <i>entered</i> } with cargoes	Tons. 46,580,	Tons. 42,216,	Tons. + 4,364,
Total, British and foreign, <i>cleared</i> } with cargoes	64,034,	58,373,	+ 5,661,

Mr. Sauerbeck's index-number for April, as given in the *Statist*, is 86·2, as against 86·7 in March, the average of the eleven years 1867-77 being taken as 100. The movement of prices during the month was, on the whole, downward. The fall has not been general. Advances occurred in vegetable foods and in minerals; but other commodities have fallen, the decline being particularly pronounced in animal food. Textiles have also moved downwards, mainly in consequence of the reaction in cotton. There has been a decline in leather, olive oil and timber. In the aggregate, both food and materials are slightly lower in price. Articles of food were 78·3, as compared with 79·2 in March, and materials were 91·9, as compared with 92·1 in March. The *Economist* index-number is 2,729, as compared with 2,717 in March.

According to the Board of Trade *Labour Gazette*, the state of the labour market in March was as follows:—

	Trade unions making returns. Net membership.	Reported as unemployed.	
		Number.	Percentage.
March, 1913	908,276	17,533	1·9
February, 1913	903,503	17,835	2·0
March, 1912	675,535	76,144	11·3

Employment continued good generally in March. There was an improvement in the iron and steel and textile trades, while in coal mining, engineering and shipbuilding, the high level of recent months was maintained. The building and brick trades showed a further seasonal advance, but there was a marked decline in the tin plate trade. It is reported by Labour Exchanges that there was a continuance of the large demand for workmen of all classes in the shipbuilding trades, and in the engineering trade there was still a scarcity of labour in some districts. In the case of women, the demand exceeded the supply in the cotton, woollen, worsted, linen and clothing trades, and in laundry work; in some districts there was a scarcity of workers in the boot and shoe industry. The upward movement in wages continued.

The eighth volume has been issued of the "Report of an Inquiry by the Board of Trade into the Earnings and Hours of Labour of Workpeople in the United Kingdom" (Cd-6556. Price 2s. 8d.). The earlier volumes related to the textile, clothing, building and woodworking trades, certain public utility services, agriculture, the metal, engineering and shipbuilding trades, and railway service; the present volume deals with over forty separate industries grouped as follows:—the paper, printing, &c., trades; the pottery, brick, glass and chemical trades; the food, drink and tobacco trades; and certain miscellaneous trades. The total number of workpeople employed in these four groups of industries in 1906 is estimated to have been about 1,400,000; about 300,000 were employed in each of the first two groups, and about 400,000 each in the food, drink and tobacco and the "miscellaneous" groups. Returns were received relating to 557,571 workpeople, or nearly 40 per cent. of the total, a proportion sufficient to ensure that the statistics are of a representative character. As explained in the earlier volumes, the object of this enquiry was to ascertain the actual earnings of all classes of workpeople in a selected week, industry by industry, occupation by occupation, and district by district, and to obtain data for estimating their total annual earnings. The particulars as to earnings, asked for in the schedules, were (*a*) a return of the total number of workpeople paid wages and of the amount of wages paid in an ordinary week of each month of 1906, together with the total amount of wages paid in that year; and (*b*) a return of the individual net earnings of workpeople, classified by occupations, in one specified week of the same year, distinguishing those who worked full time from those who worked either more or less than full time. Most of the men and boys in the trades included in this report were time workers, larger proportions of piece workers being found only in the porcelain, china and earthenware industry, the glass bottle industry, the lime and cement industry, and brush and broom manufacture; of the women and girls, nearly one-half of the total number returned were piece workers. The average earnings of men working full time in these industries in the selected week (usually the last pay-week in September, 1906) were as follows:—

	<i>s.</i>	<i>d.</i>
Paper, printing, &c., trades	34	4
Pottery, brick, glass, and chemical trades	29	2
Food, drink, and tobacco trades	26	4
Miscellaneous trades	27	11

The effect of including the earnings of men who worked more or less than full time is only to raise or lower the average by 1*d.* or 2*d.*, except in the pottery, brick, glass and chemical group, where

the average earnings of all the men returned—including those who worked more or less than full time—were 28*s.* 3*d.*, instead of 29*s.* 2*d.* The following statement shows the percentages of men returned whose earnings in a full week fell within certain limits:—

Groups of trades.	Under 20 <i>s.</i>	20 <i>s.</i> and under 30 <i>s.</i>	30 <i>s.</i> and under 40 <i>s.</i>	40 <i>s.</i> and above.
Paper, printing, &c., trades	6·8	29·7	38·8	24·7
Pottery, brick, glass, and chemical trades	9·1	49·3	29·5	12·1
Food, drink, and tobacco trades	16·4	55·4	20·6	7·6
Miscellaneous trades.....	9·5	55·8	24·9	9·8

The workpeople employed in each of the four groups of industries dealt with in this volume were mostly men and boys; but in the paper, printing, &c., group 37 per cent., and in the food, drink and tobacco group nearly 33 per cent. of all returned were women and girls. The industries in these groups employing the greatest proportions of female workpeople were cardboard box manufacture, bookbinding, paper stationery manufacture, cocoa, chocolate and sugar confectionery manufacture, preserved food, jam and pickle manufacture, biscuit making, and the tobacco industry; considerable numbers of women and girls were also returned in the printing trade, paper manufacture, and porcelain, china and earthenware manufacture. The average earnings of women returned as working a full week were 12*s.* 2*d.* in the paper, printing, &c., trades; 11*s.* 10*d.* in the pottery, brick, glass and chemical trades; 11*s.* 5*d.* in the food, drink and tobacco trades; and 12*s.* 4*d.* in the miscellaneous group of trades. About one-half of the total number of women working full time received 10*s.* and under 15*s.*, about one-fifth received 15*s.* or over, and about one-third received under 10*s.* On the basis of the returns received, the average annual earnings per head of all classes of workpeople employed in these trades in 1906 are estimated to have been about 54*l.* in the paper, printing, etc., trades, 59*l.* 10*s.* in the pottery, brick, glass and chemical trades, 48*l.* 10*s.* in the food, drink and tobacco trades, and 60*l.* in the miscellaneous group. The average hours of labour in a full ordinary week varied comparatively little between the four groups of industries; they were longest in the food, drink and tobacco group (54·1 hours), and shortest in the paper, printing, &c., trades (52·5 hours). Taking all the trades together, it appears that for about 17 per cent. of the workpeople the hours constituting a full ordinary week were less than 50, for 31 per cent., they were 50 and under 54, for 43 per cent., 54 and under 60, and for nearly 9 per cent., 60 or more.

The March number of *Biometrika* devotes nearly 160 pages to a discussion by Professor Pearson and Dr. Heron of various points in the theory of Association, challenging the serviceability of the work done by Mr. Yule in relation to that theory, and in particular the material included in the paper read before this Society on April 23, 1912. While this, like not a few other controversies, has apparently led to the detailed examination of material which might otherwise have waited long before attracting such careful attention, a discussion of the case presented at such length would be impossible within the limits afforded by this JOURNAL. If there be any Fellows of our Society who are interested in the important, but technical, matters dealt with in the memoir in question, and have not yet had their attention called to this latest contribution to the controversy, they will be better served by consulting the memoir itself than by any summary of its contents which could be given here. It is impossible, however, to refrain from expressing regret that the discussion has not been carried on so as to bring into and keep in the foreground the points of scientific interest, rather than the personal conflict, which tends to obscure the issues, and certainly mars the form of their presentation.

It is announced that the National Association for the Prevention of Infant Mortality and for the Welfare of Infancy will hold an English-speaking Conference on Infant Mortality at the Caxton Hall, Westminster, on Monday and Tuesday, August 4 and 5, 1913. The Conference is under the patronage of Their Majesties the King and Queen, and the Right Hon. John Burns, M.P., is the President. The Chairmen of Sessions include Dr. Arthur Newsholme and Sir George Newman.

On May 13 the Central Statistical Committee of Russia entered upon the fifty-first year of its existence.

In two passages of the paper by Mr. D. C. Jones in the last number of the JOURNAL (pp. 528 and 529), it is noted that the percentage of dismissals for dishonesty, on all dismissals, is greater if men and women are considered together than if men are considered alone. Attention has been called to the fact that this does not necessarily justify the conclusion that women are less honest than men. The percentage of women dismissed for dishonesty is, in fact, slightly lower than the corresponding percentage of men; in one case at least where the facts can be definitely reported.

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

Economic Review. April, 1913—Trade Unions, trade lists and the law: Geldart (Prof. W. M.). The housing question: Fry (Very Rev. Dr. T. C.). Co-partnership and labour: Lester Garland (L. F.). India and the Sugar Convention: Barker (D. A.). Out-door relief: Rogers (Rev. C. F.). Dr. Carlyle on wages: Cannon (Prof. E.).

Financial Review of Reviews. May, 1913—The Bank of England: Palgrave (Sir R. H. Inglis). The "Boom" in shipping: Chatterton (E. Keble). A non-political explanation of the fall in Consols: Rossi (Philip).

Journal of the Board of Agriculture. April, 1913—Agricultural education in Prussia.

Journal of the Institute of Actuaries. April, 1913—Some aspects of the National Insurance Act, 1911. (Part 1. National Health Insurance): Simmonds (R. C.).

Journal of the Institute of Bankers. May, 1913—The economics of banking profits, 1894-1912: Cert (E. M. George).

UNITED STATES—

American Economic Review. 1913—

March—Objections to a monetary standard based on index-numbers: Kinley (David). Methods of business forecasting based on fundamental statistics: Brookmire (J. H.). The Tariff Board and wool legislation: Culbertson (W. S.).

*Supplement to—*Population or prosperity—Annual Address of the President: Fetter (Frank A.). A remedy for the rising cost of living—Standardizing the dollar: Fisher (Irving). Banking reform in the United States: Kemmerer (E. W.). Theories of distribution.

American Statistical Association (Quarterly). March, 1913—The need of social statistics as an aid to the courts: Wilcox (W. F.). Proceedings of the seventy-fourth annual meeting of the American Statistical Association. The function of the State in relation to statistics of municipal finances: Gettemy (C. F.). Unit accounting in social work: Woods (R. A.). Some possibilities in the practical application of federal census results: Rossiter (William S.). Some recent changes in the composition of the population of the United States: Bailey (W. B.). The German Statistical Society and its annual meeting in Berlin, 1912: Würzburger (Eugen). A measure of the manner of living: Perry (C. A.).

Annals of the American Academy of Political and Social Science. March, 1913—Contains a series of papers by different authors on:—Prison labor.

Journal of Political Economy. April, 1913—The growth and distribution of Canadian population: Donald (W. J. A.). The problem of unemployment: Rubinow (I. M.). Valuation of railroads in the State of Washington: Berglund (Abraham). Economic crises: England (Minnie Throop).

FRANCE—

Journal des Économistes. April, 1913—Les dépenses militaires en Europe: *Guyot (Yves)*. L'École autrichienne d'économie politique: *Feilbogen*. La situation économique et financière de l'Italie: *Pawlowski (Auguste)*. L'Octroi de Paris. Le passé. Le présent. L'avenir: *Biermont (P. de)*. Guerre et travail: *Raffalovich (A.)*. Le revenu du Royaume-Uni: *X*.

Journal de la Société de Statistique de Paris. April, 1913—Quinze ans d'Income-tax: *Meuriot (P.)*. La prévision des crises commerciales: *Mourre (Ch.)*.

La Réforme Sociale. 1913—

April 1—La doctrine de Saint-Simon: *Clément (Henry)*. Les actions de travail, leur application pratique dans une ville industrielle: *Ballot (H.)*. Le mouvement économique et social.—France et Belgique: *Lepelletier (F.)*.

April 16—Les idées sociales de la jeunesse contemporaine: *Charpin (Frédéric)*. Le mouvement économique et social.—Pays de langue anglaise: *Angot des Rotours (Baron)*.

GERMANY—

Archiv für Sozialwissenschaft und Sozialpolitik. March, 1913—Die naturphilosophischen Grundlagen der Wirtschaftstheorie: *Bulgakoff (Prof. Sergei)*. Petroleum-Monopol. Ueber die Fortschritte der gesetzlichen Regelung der Arbeitszeit in Frankreich: *Louis (Paul)*. Die neue wohnungspolitische Gesetzgebung Oesterreichs: *Forchheimer (Dr. Karl)*. Die Kaufkraft des Geldes: *Eggenschwyler (H.)*. Literatur zum Petroleummonopol: *Vogelstein (Dr. Th. M.)*. Der Geburtenrückgang: *Budge (Dr. Siegfried)*.

Jahrbücher für Nationalökonomie und Statistik (Conrad's). April, 1913 — Der kommunale Wohnungsnachweis: *Rusch (M.)*. Das Leuchtölmonopol des Deutschen Reiches: *Schmidt (Erhard)*. Denkschrift des Deutschen Handwerks- und Gewerbekammertages betr. Abänderung des Handwerkergesetzes vom 26 Juli, 1897: *Hampke (Th.)*. Die neuesten Veröffentlichungen des Internationalen Statistischen Instituts: *Kollmann (Paul)*.

Zeitschrift für die gesamte Staatswissenschaft. Heft 2, 1913—Die Zehntablösung in Württemberg: *Reinhard (O.)*. Aenderungen in Wesen und Richtung des Handels: *Gehrke (F.)*. Wirtschaftsgeschichte an Handelshochschulen: *Kuske (Bruno)*. Die deutsche Kammerpresse: *Kootz (Robert)*. Die Sommersterblichkeit der Säuglinge in den deutschen Grossstädten: *Morgenroth (H.)*. Vermischte Beiträge zur Wohnungsfrage: *Katscher (Leopold)*. Krankenkassenverbände und Leipziger Aerzteverband.

Zeitschrift für die gesamte Versicherungs-Wissenschaft. May, 1913—Hat die deutsche Sozialversicherung die in sie gesetzten Erwartungen erfüllt?: *Zwiedineck-Südenhorst*.

MONTHLY LIST OF ADDITIONS TO THE LIBRARY.

During the period that has elapsed since April 10, 1913, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

(a) Foreign Countries.

Argentina—

Léxico de los Poblados Argentinos que poseían un Servicio Ferrocarrilero Telegráfico ó Postal en el primer Centenario de la Emancipación. Svo. 1911. (The Director General of Statistics.)

Austria—

Agriculture and Livestock. Ergebnisse der Viehzählung vom 31. Dezember, 1910. Heft 1. Die summarischen Ergebnisse der Viehzählung. Fol. 1912. (The Statistical Bureau.)

Bohemia—

Agriculture. Anbau- u. Erntestatistik sowie Statistik der wichtigsten Zweige der Landwirtschaftlichen Industrie für 1910-12. 2 vols., Svo. 1912. (The Statistical Bureau.)

Education. Beiträge zur Statistik des Volksschulwesens (II. Reihe). Svo. 1912. (*Id.*)

Finance. Ausgaben und Einnahmen der Bezirksvertretungen in 1900 bis 1909. Svo. 1912. (*Id.*)

Finance. Vermögen und Schulden von 134 Bezirksvertretungen nach dem Stande vom 1. Januar 1900 und 1910. Svo. 1912. (*Id.*)

Statistik der zu Zwecken der örtlichen Selbstverwaltung für 1908 vorgeschriebenen Zuschläge und ihrer Basis. Svo. 1911. (*Id.*)

Belgium—

Agriculture. Exposé statistique de la situation des Associations d'intérêt agricole pendant 1910. 56 pp., Svo. 1912. (The Ministry of Agriculture.)

Census. Population. Recensement Général du 31 Décembre 1910. Tome 2, fol. 1912. (The Ministry of the Interior.)

Exposé de la situation du Royaume de 1876 à 1900. Tome 2, 897 pp., Svo. 1912. (*Id.*)

Labour. Rapport . . . sur la réparation des dommages résultant des accidents du travail pendant 1909-11. 283 pp., 4to. 1913. (The "Office du Travail.")

Denmark—

Births. Mariages, Naissances et Décès, 1906-10. 4to. 1913. (The State Statistical Bureau.)

Greenland. Statistiske Meddelelser sammendrag af Statistiske Oplysninger om Grønland. 42 pp., Svo. Copenhagen, 1912. (*Id.*)

Iceland. Statistiske Meddelelser sammendrag af Statistiske Oplysninger om Island. 72 pp., Svo. Copenhagen, 1907. (*Id.*)

United States—*Census Bureau—*

13th Census of United States, 1910. Abstract of Census. 4to. 1913. (The Bureau.)

Special Reports. Financial Statistics of cities having a population of over 30,000: 1909. 4to. 1913. (*Id.*)

Census, 1910. Bulletins. Population: (1) Age and marital condition. (2) Color or race, nativity, parentage and sex. (3) Country of origin of foreign born and their year of immigration. (4) School attendance and illiteracy. (5) State of birth of native population. 5 parts. 4to. 1913. (*Id.*)

Census, 1910. Bulletin. Irrigation. 4to. 1913. (*Id.*)

(a) **Foreign Countries—Contd.****United States—Contd.**

California. 15th Biennial Report of Bureau of Labor Statistics, 1911-12. Svo. 1912. (The Bureau.)

Massachusetts. Report of Homestead Commission made under provisions of Chapter 714 of Acts of 1912. January, 1913. Svo. 1913. (The Bureau.)

Columbia University Studies—

Vol. 51. The sale of liquor in the South. History of development of a normal social restraint in Southern Commonwealths: *L. S. Blakey*. 4to. 1912. (P. S. King and Son.)

Vol. 53. The Civil War and reconstruction in Florida: *W. W. Davis*. Svo. 1913. (*Id.*)

International—

Problems in Eugenics. Vol. 2. Report of Proceedings of First International Eugenics Congress, London, July 24-30, 1912, with an Appendix containing those Papers communicated to the Congress not included in Vol. 1. Svo. 1913. (The Eugenics Education Society.)

(b) **India and Colonies.****India, British—**

Census of India, 1911. Vol. iii. Assam. Part 1. Report. Part 2. Tables. 2 vols., fol. 1912. (The India Office.)

— Vol. xv. United Provinces of Agra and Oudh. Part 1. Report. Part 2. Imperial Tables. 2 vols., fol. 1912. (*Id.*)

— Vol. xxii. Rajputana and Ajmer-Merwara. Part 2. Tables. Fol. 1912. (*Id.*)

Australia, Commonwealth of—

Census of 1911. Census Bulletin No. 16. Occupations. Fol. 1913. (The High Commissioner for Australia.)

Canada—*Census—*

Bulletin 1. Manufactures for 1910 as enumerated under date of June 1, 1911. 30 pp., Svo. 1912. (The High Commissioner for Canada.)

— 2. Manufactures of Dairy Industries for 1910 as enumerated under date of June 1, 1911. 6 pp., Svo. 1912. (*Id.*)

— 12. Religions of Canada for 1911 as enumerated under date of June 1, 1911. 11 pp., Svo. 1913. (*Id.*)

— 13. Origins of People for 1911 as enumerated under date of June 1, 1911. 12 pp., Svo. 1913. (*Id.*)

Wholesale Prices, Canada, 1912. Report by R. H. Coats. 2 copies, Svo. Ottawa, 1913. (Mr. R. H. Coats.)

Ceylon—

Census of Ceylon, 1911. Occupation Statistics, showing occupations of Population by Race and Sex. Fol. 1912. (The Crown Agents for the Colonies.)

New Zealand—

Census. Results of Census of Dominion of New Zealand taken for night of April 2, 1911. Fol. Wellington, 1912. (The Government Statistician.)

Union of South Africa—

Census, 1911. Part 7. Birthplaces. Part 8. Sickness and Infirmities. Part 9. Live Stock and Agriculture. Part 10. Supplementary Tables. 4 parts, fol. 1913. (The Census Office.)

(c) **United Kingdom and its Several Divisions.****United Kingdom—**

Bills of Exchange and Cheques. Correspondence relating to Conference at The Hague, June, 1912. [Cd-6680.] 1913. (Sir H. Verney, M.P.)

(c) United Kingdom and its Several Divisions.—*Contd.***United Kingdom—Contd.**

- Civil Service. Appendix to Third Report of Royal Commission. [Cd-6740.] 1913. (Purchased.)
- Education. Final Report of Royal Commission on University education in London. [Cd-6717.] 1913. (*Id.*)
- Exports (Manufactured and Partly Manufactured Articles). (536.) 3 pp. 1913. (*Id.*)
- Forestry. Advisory Committee on Forestry. Reports, July to October, 1912. [Cd-6713.] 1913. (Sir H. Verney, M.P.)
- India. Income and Expenditure from 1901-02 to 1911-12. (30.) 1913. (Purchased.)
- (Sanitary.) Proceedings of Second All-India Sanitary Conference held at Madras in November, 1912. [Cd-6777.] 1913. (Sir H. Verney, M.P.)
- Labour. Departmental Committee on Night work of male young persons in Factories and Workshops. Minutes of evidence and appendices. [Cd-6711.] 1913. (Purchased.)
- Report of Enquiry into Earnings and Hours of Labour of Workpeople of United Kingdom. VIII. Paper, Printing, &c., Trades; Pottery, Brick, Glass and Chemical Trades; Food, Drink and Tobacco Trades; and Miscellaneous Trades, in 1906. [Cd-6556.] 1913. (The Board of Trade.)
- Parliamentary Papers. General Index to Bills, Reports, Estimates, Accounts and Papers printed by order of House of Commons, and to Papers presented by Command, 1900-09. (351.) 1912.
- Trade. Reports of British Trade in certain Colonies. [Cd-6771.] 1913. (Sir H. Verney, M.P.)
- Tuberculosis. Departmental Committee on Tuberculosis. Final Report. Vol. 1. Report. [Cd-6641.] Vol. 2. Appendix. [Cd. 6654.] 1913. (Purchased.)
- United States. Proposed new Customs Tariff. [Cd-6774.] 1913. (Sir H. Verney, M.P.)
- West Africa. Vital Statistics of Non-Native Officials. Returns for 1912. [Cd-6672.] 1913. (Purchased.)

England and Wales—

- Census of England and Wales, 1911. Vol. vi. Buildings of Various Kinds. [Cd-6577.] 1913. (The Census Office.)
- Cancer Mortality Statistics of England and Wales, 1851-1910. With map and diagrams. 24 pp., Svo. 1913. (Society for the Prevention and Relief of Cancer.)
- London County Council—
- Finance. Arrest in the growth of the rateable value of London. Fol. 1913. (Purchased.)
- Homeless Persons. Census of, February 14, 1913. Fol. 1913. (*Id.*)

Ireland—

- Census of Ireland, 1911. General Report with Tables and appendix. [Cd-6663.] 1913. (The Census Commissioners.)

Scotland—

- Agriculture. First Report of Board of Agriculture for Scotland for nine months ended December 31, 1912. [Cd-6757.] Svo. 1913. (Sir H. Verney, M.P.)
- Education (Scotland). First Report on Medical Inspection of School Children in Scotland. Svo. 1913. (Purchased.)

(d) Authors, &c.

- Adler (*Dr. Karl*). Kapitalzins und Preisbewegung. 48 pp., Svo. Munchen. 1913. (Duncker and Humblot.)
- Arenel (*Vicomte G. d'*). Histoire économique de la propriété, des salaires, des denrées . . . depuis 1200 jusqu'en l'an 1800. Tome 6. La. Svo. Paris, 1912. (Purchased.)

(d) **Authors, &c.—Contd.**

- Cadbury (Edward)*. Experiments in Industrial Organization. With Preface by W. J. Ashley. xxi + 296 pp., 8vo. London, 1912. (Longmans and Co.)
- Clark (John Bates and John Maurice)*. The Control of Trusts. ix + 202 pp., sm. 8vo. New York, 1912. (Macmillan and Co.)
- Collins (E. A.)*. Leasehold Emfranchisement. The Case for and against and a Practical Scheme. Relief against restrictive covenants in Leases: Scheme for Continuity of Tenure. 117 pp., sm. 8vo. London, 1913. (P. S. King and Son.)
- Copeland (Melvin T.)*. The Cotton Manufacturing Industry of the United States. xi + 415 pp., 8vo. Cambridge, 1912. (The Oxford University Press.)
- Effertz (O.)*. Le Principe Ponophysocratique et son application à la question sociale. Leçon d'Ouverture faite à la Faculté de droit de l'Université de Paris. 65 pp., sm. 8vo. Paris, 1913. (Marcel Rivière and Co.)
- Elbow (Engineer Rear-Admiral G.)*. The New English System of Money, Weights and Measures, and of Arithmetic. 40 pp., sm. 8vo. London, 1913. (P. S. King and Son.)
- Ferraris (Carlo F.)*.—
Distribuzione regionale degli Inseriti e dei Laureati nelle Facoltà Universitarie e nelle corrispondenti sezioni e scuola degli istituti superiori del Regno. 27 pp., 8vo. Roma, 1913. (The Author.)
Inseriti nel diciannovenno scolastico dal 1893-94 al 1911-12, e Laureati e Diplomatici nel settennio scolastico dal 1904-05 al 1910-11, nelle Università e negli Istituti superiori italiani. 15 pp., 8vo. Torino, 1913. (*Id.*)
Statistica ed Elenco dei Soci stranieri della Reale Accademia dei Lincei dal 1873 al 1912 distinti per Nazionalità. 19 pp., 8vo. Roma, 1913. (*Id.*)
- Gerloff (Dr. Wilhelm)*. Die Finanz- und Zollpolitik des Deutschen Reiches nebst ihren Beziehungen zu Landes- und Gemeindefinanzen von der Gründung des Norddeutschen Bundes bis zur Gegenwart. xvi + 553 pp., 8vo. Jena, 1913. (Purchased.)
- Halbwachs (Maurice)*. La théorie de l'homme moyen. Essai sur Quetelet et la statistique morale. 180 pp., 8vo. Paris, 1913. (Felix Alcan.)
- Henningsen (Dr. Adolf)*. Die gleitende Skala für Getreidezölle. xiv + 116 pp., la. 8vo. Jena, 1912. (Purchased.)
- Higginson (John Hedley)*. Tariffs at work. An outline of practical tariff administration, with special reference to the United States and Canada. xiv + 136 pp., 8vo. London, 1913. (P. S. King and Son.)
- Hourwich (Isaac A.)*. Immigration and Labor. The Economic Aspects of European Immigration to the United States. xvii + 544 pp., 8vo. London, 1912. (G. P. Putnam's Sons.)
- Innes (Charles E.)*. Citizens' Charter. A scheme of National Organisation. 31 pp., 8vo. 1913. (The Author.)
- Jaeckel (Dr. Reinhold)*. Die Selbstmorde im Kreise Teltow, 1810-1910. 26 pp., fol. 1912. (*Id.*)
- Kaplan-Kogan (Wlad. W.)*. Die Wanderbewegungen der Juden. viii + 164 pp., 8vo. Bonn, 1913. (A. Marcus and E. Webers Verlag.)
- Kennan (Kossuth Kent)*. Income Taxation Methods and Results in Various Countries. 8 + 347 pp., 8vo. Milwaukee, 1910. (The Author.)
- Mayr (Dr. Georg von)*. Statistik und Gesellschaftslehre. Band 3. Sozialstatistik. (Moralstatistik, Bildungsstatistik, Wirtschaftsstatistik, Politische Statistik.) Teil 1. Moralstatistik. Lieferung 4. 82 pp., 8vo. 1913. (*Id.*)
- Methorst (H. W.)*.—
Nederlandsche Bevolkingsstatistiek. (Overdruk uit De Economist. Jaargang 1913.) 2 parts, 8vo. 1913. (The Author.)
Zuigelingensterfte in Nederland in Verband met de Uitkomsten van het Haagsche Onderzoek 1908-09. 20 pp., 8vo. 1913. (*Id.*)
Résumé rétrospectif de l'Annuaire Statistique des Pays-Bas. xi + 105 pp., 8vo. La Haye, 1911. (*Id.*)
- Michel (E.)*. La valeur vénale de la propriété non bâtie en France. (1911.) 9 pp., la. 8vo. Paris, 1911. (Berger, Levrault and Co.)
- Mims (Stewart L.)*. Colbert's West India Policy. xiv + 385 pp., 8vo. 1912. (The Yale University Press.)

(d) **Authors, &c.—Contd.**

- Morse (H. B.)*. Trade and Administration of China. Revised edition. viii + 466 pp., 8vo. 1913. (Longmans, Green and Co.)
- Mortara (Giorgio)*. Messina: come vive. 53 pp., 8vo. Rome, 1913. (The Author.)
- Munsterberg (Hugo)*. Psychology and Industrial Efficiency. 320 pp., 8vo. London, 1913. (Purchased.)
- Palmer (Truman G.)*. Sugar at a Glance. The Influence of Sugar-Beet Culture on Agriculture, and its importance in relation to National Economics. 63 pp., 4to. Washington, 1912. (The Author.)
- Pierson (N. G.)*. Les revenus de l'État. Traduction française par Louis Suret. 386 pp., 8vo. Paris, 1913. (Giard and Brière.)
- Prothero (Rowland E.)*. English Farming Past and Present. xiii + 504 pp., 8vo. London, 1912. (Purchased.)
- Redlich (Josef)*. Local Government in England. Edited with additions by Francis W. Hirst. 2 vols., 8vo. London, 1903. (*Id.*)
- Robinson (E. F.)*—
Cost of Government in Minnesota: being chapter xv of Third Biennial Report of Minnesota Tax Commission. 343 pp., 8vo. St. Paul, 1912. (The Minnesota Tax Commission.)
Railroad Taxation in Minnesota. Analysis of the Gross Earnings Tax: being chapter xiv of Third Biennial Report of Minnesota Tax Commission. 58 pp., 8vo. St. Paul, 1912. (*Id.*)
- Rozenraad (C.)*. Table comparing Gold and Silver Stock of principal Banks of Issue, their Bank Rate, Rate of Exchange on London and Price of different Government Stocks of various countries of Europe at end of March, 1913 and 1912. Sheet fol. 1913. (The Compiler.)
- Samuel (Horace B.)*. The Land and yourself. A popular discussion of the Land question and of the proposals advanced for its solution. xi + 115 pp., 8vo. London, 1913. (T. Murby and Co.)
- Searfield (Harold, M.D.)*—
Tuberculosis in the British Isles, and Measures for its Prevention. 16 pp., 1a. 8vo. 1912. (Dr. Dudfield.)
Lung Diseases among the Sheffield Grinders. 6 pp., 8vo. 1909. (*Id.*)
- Seligman (Edwin R. A.)*. L'Impôt sur le Revenu. Traduction française par W. Oualid. xii + 842 pp., 8vo. Paris, 1913. (Giard and Brière.)
- Sigerus (A.)*. Handelsbetriebsstatistik mit besonderer Berücksichtigung der Warenhandelsbetriebe. Ergänzungshefte zum Deutschen Statistischen Zentralblatt. Heft 2. 82 pp., 8vo. Leipzig, 1913. (B. G. Teubner.)
- Silbergleit (Prof. Dr. H.)*. Statistische Beiträge zur Frage der Lebensmittelversorgung in deutschen Grossstädten. Bericht an den Vorstand des Deutschen Städtetages im Auftrage seiner Kommission. 75 pp., 8vo. Berlin, 1912. (The Author.)
- Slater (Gilbert)*. The making of modern England. xi + 303 pp., 8vo. London, 1913. (Purchased.)
- Snow (E. C.)*. The Intensity of Natural Selection in Man. From *Biometrika*, Vol. IX., Nos. 1 and 2, March, 1913. 12 pp., 8vo. 1913. (The Author.)
- Tougan-Baranowsky (Michel)*. Les crises industrielles en Angleterre. Traduit sur la 2^e édition russe par Joseph Schapiro. vii + 476 pp., 8vo. Paris, 1913. (Giard and Brière.)
- Turner (Edward H.)*. The repayment of local and other loans, sinking funds. xxvii + 536 pp., 8vo. Manchester, 1913. (Purchased.)
- Van Elewyck (Ernest)*. La Banque Nationale de Belgique. Les Théories et Les Faits. Tome 1, 380 pp. Tome 2, 412 pp. 2 vols., 8vo. 1913. (The Author.)
- Vincey (Paul)*. Le prix de la viande à Paris. 151 pp., 4to. Paris, 1912. (Purchased.)
- Wagner (A.) and Deite (H.)*. Histoire de l'Impôt depuis l'antiquité jusqu'à nos jours. 2 vols., 8vo. Paris, 1913. (Giard and Brière.)
- Warmink (Jens)*. Handbog i Danmarks Statistik. Heft 4. 8vo. Copenhagen, 1913. (Purchased.)
- Withers (Hartley)*. Money-Changing. An introduction to foreign exchange. viii + 183 pp., 8vo. London, 1913. (Smith, Elder and Co.)

JOURNAL

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The CENSUS of IRELAND, 1911.

By SIR WILLIAM J. THOMPSON, M.D.

[Read before the Royal Statistical Society on Tuesday, May 20, 1913,
the President, Professor F. Y. EDGEWORTH, M.A., F.B.A., in the Chair.]

AT the outset of this Paper I should like first to thank the President and Council of the Royal Statistical Society for the privilege they have accorded me in permitting me to come before you this afternoon, and secondly to apologise for the attempt to crowd into a short space of time even a very brief summary of the recent Census of Ireland. When we remember the amount of useful and valuable information contained in the thirty-four separate county and county borough publications, the four provincial summaries, and the general report, we can realise how difficult it is to deal, in the time at our disposal, with such an amount of published material. I can only, therefore, bring under your notice this afternoon a few leading features which, in my opinion, are of most interest to the general community, by a comparison of the results of the 1911 Census with those of the different Censuses extending back seventy years (1841), and embracing seven successive intercensal periods.

On March 15, 1911, I read a Paper before the Statistical and Social Inquiry Society of Ireland entitled, "The Development of the "Irish Census and its National Importance." In that Paper I made the following statement, viz.:—that "all the preliminary arrangements as regards the printing of the several forms and their "distribution to the Superintendents of Enumeration had been "completed."

Before the end of March, 1911, the enumerators had left in each house, for each family therein, a form (called Form "A") with instructions that this form was to be filled up by the head of the family on the night of Sunday, April 2, 1911. The collection by the enumerators of the forms duly filled up, commenced on the morning of April 3. After their collection they were arranged and

summarised by townlands, and in the urban districts by streets. In due course these summaries were forwarded by the Superintendents of Enumeration to the Census Office, where they in turn were put together for larger areas. From these a preliminary report was drawn up and presented to His Excellency, the Lord Lieutenant, on May 18, 1911. This report contained tables giving information as to the following subjects:—

- No. I. The number of inhabitants in each county and province in 1841, 1851, 1861, 1871, 1881, 1891, 1901, and 1911.
- No. II. The religious professions of the inhabitants of each county and province in 1911.
- No. III. The number of families in each county and province in 1841, 1851, 1861, 1871, 1881, 1891, 1901, and 1911.
- No. IV. The number of inhabited houses in each county and province in 1841, 1851, 1861, 1871, 1881, 1891, 1901, and 1911.
- No. V. The number of inhabited houses and religious professions of the population in the Parliamentary divisions in 1911.
- No. VI. The number of inhabited houses, and the population of Dublin City and the urban districts of Rathmines and Rathgar, Pembroke, Blackrock and Kingstown in 1901 and 1911.
- No. VII. The number of inhabited houses, and the population in 1901 and 1911, of provincial towns having, in 1901, a population exceeding 10,000.
- No. VIII. The number of houses and families, and the population within the Dublin Metropolitan Police District in 1881, 1891, 1901, and 1911.

On examining these tables we find the county was the basis on which the first four tables were compiled, and these dealt with population, religious profession, number of families and inhabited houses.

In Table V we have the parliamentary divisions, dealing with inhabited houses, religion and population; and Table VI, Dublin and the surrounding urban districts, for houses and population; Table VII comprises all towns in Ireland with a population exceeding 10,000 in the year 1901 for houses and population; and, finally, in Table VIII details of the Dublin Metropolitan Police district are shown as regards houses, families and inhabitants therein.

While this report was being prepared from the summaries sent forward by the Superintendents of Enumeration, the other Census enumeration forms (24 in number), having been completed locally, were being received, labelled and temporarily deposited in the crypts of the Census Office. Immediately on the completion of

the preliminary report the work of the Census proper commenced, and to deal with all this material a large temporary staff had been engaged, who were called in to take up duty as the requirements of the office demanded.

As on all former Censuses, the enumeration was carried out by members of the Royal Irish Constabulary all over Ireland; except in Dublin and surrounding districts, where the work was performed by the Dublin Metropolitan Police.

For the extraction and tabulation of the different items of information required by the Census Act, 1910, the office work was divided into five sections:—

1. Houses and house accommodation.
2. Ages and education of the people.
3. Religious professions.
4. Occupations.
5. Vital statistics.

Almost all the information required for these sections was extracted direct from the Family Form (Form "A") mentioned above.

Population.

The population of Ireland on April 2, 1911, was ascertained to be 4,390,219, viz., 2,192,048 males and 2,198,171 females, showing a decrease from the former Census of 68,556 persons, or 1·5 per cent.

This has been the smallest decrease recorded since the Census of 1841.

In Table 1, the population of Ireland at each Census, commencing with 1821, is given:—

TABLE 1.—*Comparative view of the population of Ireland at each of the ten Censuses from 1821 to 1911.*

Census periods.	Population.			Increase or decrease of population between the Census periods.			
	Persons.	Males.	Females.	Number of persons.		Rate per cent.	
				Increase.	Decrease.	Increase.	Decrease.
1821....	6,801,827	3,341,926	3,459,901	—	—	—	—
'31....	7,767,401	3,794,880	3,972,521	965,574	—	14·19	—
'41....	8,175,124	4,019,576	4,155,548	407,723	—	5·25	—
'51....	6,552,385	3,190,630	3,361,755	—	1,622,739	—	19·85
'61....	5,798,967	2,837,370	2,961,597	—	753,418	—	11·50
'71....	5,412,377	2,639,753	2,772,624	—	386,590	—	6·67
'81....	5,174,836	2,533,277	2,641,559	—	237,541	—	4·39
'91....	4,704,756	2,318,953	2,385,797	—	170,086	—	9·08
1901....	4,458,775	2,200,040	2,258,735	—	245,975	—	5·23
'11....	4,390,219	2,192,048	2,198,171	—	68,556	—	1·54

Note.—The navy and military serving in Ireland are included in the Population Tables in 1861 and later, but not in previous Censuses.

TABLE 2.—*Comparative view of the population of Ireland by provinces at each of the eight Censuses, 1841-1911.*

Provinces.*	Number of persons in								Increase or decrease between 1901 and 1911.		
	1841.	1851.	1861.	1871.	1881.	1891.	1901.	1911.	Increase.	Decrease.	Rate per cent.
Munster	2,401,460	1,865,600	1,513,558	1,393,485	1,331,115	1,173,643	1,076,188	1,035,495	—	40,693	3·8
Ulster	2,389,263	2,013,879	1,914,236	1,833,228	1,743,075	1,619,814	1,582,826	1,581,696	—	1,130	0·1
Leinster	1,982,169	1,682,320	1,457,635	1,339,451	1,278,989	1,191,782	1,152,829	1,162,044	9,215	—	0·8
Connaught	1,420,705	1,012,479	913,135	846,213	821,657	719,511	646,932	610,984	—	35,948	5·6
Total of Ireland	8,196,597	6,574,278	5,798,967†	5,412,377	5,174,836	4,704,750	4,458,775	4,390,219	—	68,556	1·5
Intercensal decrease—											
Numbers	—	1,622,319	775,311	386,590	237,541	470,086	245,975	68,556	—	—	—
Per cent.	—	19·8	11·8	6·7	4·4	9·1	5·2	1·5	—	—	—

* The numbers given are for the provinces as existing at the respective dates except 1891, the numbers for which have been readjusted in accordance with the Local Government (Ireland) Act, 1898.

† Including 403 persons at sea on Census night of 1861 who were returned upon English shipping forms only.

Table 2 shows the results of each Census from that of 1841, by provinces.

I will now put on the screen three slides,¹ derived from the foregoing table :—

- (a) A diagram showing the numerical decrease for each inter-censal period.
- (b) A diagram representing the decrease, in pillar form.
- (c) A further pillar diagram giving the decrease per cent. at each of the Census periods.

From these three slides and the preceding table it will be observed that the greatest decrease was between the years 1841 and 1851, next between 1851 and 1861, the third greatest decrease was between 1881 and 1891. The smallest decrease, until the 1901 Census, was between 1871 and 1881, viz., 4·4 per cent., which is three times as great as that shown at last Census, 1·5.

The subjoined table (3) shows by provinces, the decrease per cent. of the population in each of the seven Censuses, 1851-1911, as compared with 1841.

Provinces,	Decrease per cent. in the population as compared with 1841.							
	1841.	1851.	1861.	1871.	1881.	1891.	1901.	1911.
Munster	—	22·4	37·1	42·0	44·6	51·2	55·2	56·9
Ulster	—	15·7	19·9	23·3	27·0	32·2	33·8	33·8
Leinster	—	15·1	26·5	32·4	35·5	39·9	41·8	41·4
Connaught	—	28·7	35·7	40·4	42·2	49·4	54·5	57·0
Ireland	—	19·8	29·3	34·0	36·9	42·6	45·6	46·4

The next slide, a pillar diagram, illustrates the above table. This shows Munster as having the greatest numerical decrease, with a decrease per cent. slightly less than that of Connaught; a large and steady decrease for Connaught, which has lost more, relatively, than any other province; Ulster and Leinster come out better—Leinster at the last Census showing an increase as compared with 1901 of 0·8 per cent.

As illustrating the movements of rural and town populations in Ireland, I have compiled the following table (4), which shows for each of the eight Census years, 1841-1911, the proportion per cent. of the population of (a) “civic” areas (towns of 2,000 inhabitants and

¹ The Paper was illustrated by numerous lantern slides, showing in graphic form the substance of the tables contained in the Paper. Owing to pressure of space, the Editors regret that they are unable to reproduce the slides in the form of diagrams.

upwards and (b) rural areas (remainder of Ireland) as existing at each of the Census years :—

	Proportion per cent. of the population of Ireland in							
	1841.	1851.	1861.	1871.	1881.	1891.	1901.	1911.
"Civic" areas	14.0	18.7	19.7	22.2	24.1	26.4	31.1	33.5
Rural areas.....	86.0	81.3	80.3	77.8	75.9	73.6	68.9	66.5
Ireland	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The next slide depicts the above in diagrammatic form.

Density of population.

The number of acres to each person in 1911 was 4.6 ; in 1901, 4.5 ; in 1891, 4.3 ; and in 1881, 3.9, showing an increase of 0.7, or nearly three-quarters of an acre to each person within the last thirty years.

Excluding uncultivated tracts, the arable acreage per person was 3.9 in 1911 ; 3.4 in 1901 ; 3.2 in 1891 ; and 2.9 in 1881, showing an increase of one acre of arable land to each person within the same period (thirty years).

As regards the density of the population in the county boroughs, the following results are interesting : The 6 county boroughs arranged according to the order of the density of their populations were Dublin, Cork, Belfast, Waterford, Limerick, and Londonderry.

The average number of persons to an acre in Dublin was 38.53, in Belfast 25.91, Londonderry being the lowest, viz., 15.81. It is also interesting to note that the density per house is much greater in Dublin than in Belfast, there being an average of 8.2 persons to each house in Dublin, and only 5.0 persons to each house in Belfast.

Emigration.

The normal increase in population of a country would be (taking for granted there was no emigration or immigration) the excess of the births over the deaths. In Ireland, however, we have to take into consideration the great amount of emigration, and this drain on our country has continued since the year 1845.

Table 4A shows for each of the twenty years, 1892-1911, the rates per 1,000 of the estimated population represented by marriages, births and deaths registered, and by the number of emigrants enumerated.

Years.	Rate per 1,000 of estimated population.			
	Marriages.	Births.	Deaths.	Emigrants.
1892.....	4.65	22.5	19.4	11.0
'93.....	4.71	23.0	18.0	10.4
'94.....	4.71	23.0	18.2	7.8
'95.....	5.07	23.3	18.5	10.7
'96.....	5.08	23.7	16.7	8.6
'97.....	5.05	23.5	18.5	7.2
'98.....	5.00	23.3	18.2	7.1
'99.....	4.96	23.1	17.7	9.2
1900.....	4.78	22.7	19.6	10.1
'01.....	5.08	22.7	17.8	8.9
'02.....	5.18	23.0	17.5	9.1
'03.....	5.21	23.1	17.5	9.0
'04.....	5.21	23.6	18.0	8.4
'05.....	5.25	23.4	17.1	7.0
'06.....	5.16	23.6	16.9	8.0
'07.....	5.14	23.2	17.6	8.9
'08.....	5.19	23.3	17.6	5.3
'09.....	5.17	23.5	17.1	6.5
'10.....	5.05	23.3	17.1	7.4
'11.....	5.37	23.3	16.6	7.0

This slide is taken from my 48th Annual Report, by kind permission of the Controller of His Majesty's Stationery Office, and the foregoing table gives the details.

Had there been no emigration from Ireland, our normal annual increase would, during the past five years, have amounted to about 26,000. Emigration, however, drains the country of more than that number, about 30,000 annually, and in one year only, viz., the year 1908, was the balance on the right side. In that year the number of births exceeded the number of deaths and of emigrants by 1,853. In the following table (5) the actual figures for the period of five years (1907-11) referred to are set forth, as also shown on the screen :—

TABLE 5.—*Showing the number of births and deaths registered and the number of emigrants (natives of Ireland) enumerated during each of the five years 1907-11.*

Years.	Number of births.	Number of deaths.	Number of emigrants.
1907.....	101,742	77,334	39,082
'08.....	102,039	76,891	23,295
'09.....	102,759	74,973	28,676
'10.....	101,963	74,894	32,457
'11.....	101,758	72,475	30,573
Average, 1907-11....	102,052	75,313	30,817

From May 1, 1851—when the collection of the statistics of the Emigrants from Ireland first commenced—to March 31, 1911, we find that no less than 4,191,552 natives of Ireland left the country with the intention of settling permanently abroad. Of these, 2,178,296 were males, and 2,013,256 females. In the following table (6) the numbers are shown for each decennial period, as also the annual rate per 1,000 of the mean population.

TABLE 6.—*Showing by sexes the number of emigrants (natives of Ireland) who left Irish ports during the decennial periods ending with March 31 of the years 1861, 1871, 1881, 1891, 1901, and 1911, respectively, with the annual rate per 1,000 of the mean population.*

Decennial periods.	Males.	Females.	Total.	Annual rate per 1,000 of mean population.
1851*-61	601,852	576,034	1,177,886	19.1
'61-71	469,772	376,951	846,723	15.0
'71-81	340,928	281,758	622,686	11.9
'81-91	393,744	374,361	768,105	15.5
'91-1901	200,125	230,868	430,993	9.4
1901-11	171,875	173,284	345,159	7.8
Total, 1851*-1911	2,178,296	2,013,256	4,191,552	13.4

* From May 1, 1851.

The next diagram on the screen shows this in pillar form.

It will be seen that by far the greatest number left between the years 1851-61, the next largest between 1861-71, then between 1881-91, the period 1871-81 coming next, while the last two decades show the smallest number. The recent decennial period shows a considerable decrease on that of 1891-1901. Looking again closely at this diagram one will observe that during the first four decennia there was a fairly even division of the sexes of the emigrants, whereas, during the two last decennial periods the number of females has exceeded that of males. The figures giving the differences between the sexes are shown in the next table (7).

TABLE 7.—*Showing the difference in the numbers of male and female emigrants from Ireland during each of the six intercensal periods from 1851-1911.*

Period.	Excess of males over females.	Excess of females over males.	Period.	Excess of males over females.	Excess of females over males.
1851-61	25,818	—	1881-91	19,383	—
'61-71	92,821	—	'91-1901	—	30,743
'71-81	59,170	—	1901-11	—	1,409

As regards the ages of the emigrants, the following table (8) shows for each of the age periods, under 15 years, 15 and under 35 years, and 35 years and upwards, the proportion per cent. of the emigrants (natives of Ireland) who left the ports of Ireland during each of the decennia 1861-70, 1871-80, 1881-90, 1891-1900 and 1901-10 :—

Decennia.	Proportion per cent. of emigrants.			
	Under 15 years.	15—35.	35 and upwards.	All ages.
1861-70	15·4	72·2	12·4	100
'71-80	14·4	73·1	12·5	100
'81-90	13·7	75·9	10·4	100
'91-1900	7·8	83·7	8·5	100
1901-10	8·9	83·3	7·8	100

The next slide is prepared from this table (8) and is interesting, and at the same time gives cause for reflection.

Comparing the ten-yearly periods from 1861 to 1910 it will be seen that the proportion per cent. of those between the ages of 15 and 35 years has steadily increased. Conversely we find that the number under 15 and over 35 has decreased. Thus there is a gradually increasing drain on our country at that period in the life of our people which is most economic and valuable to the state. This fact we must look upon as serious, and if Ireland is to retain its position, and increase in health and prosperity, the strong and healthy young people must remain at home.

A moment ago I referred to the fact that the number of women emigrants was relatively increasing, and the diagram I now exhibit, taken from the following table (9), shows the number of females in Ireland to every 1,000 males, according to each of the eight Censuses, 1841-1911 :—

Census years.	Proportion of males to females.		Census years.	Proportion of males to females.	
1841....	1,000 males	to 1,028 females	1881	1,000 males	to 1,043 females
'51 ...	1,000	„ 1,046 „	'91	1,000	„ 1,029 „
'61....	1,000	„ 1,044 „	1901	1,000	„ 1,027 „
'71....	1,000	„ 1,050 „	'11	1,000	„ 1,003 „

In 1841, to every 1,000 males there were 1,028 females; that number had increased in 1851 to 1,046; in 1861 it stood at 1,044; in 1871 it went up to 1,050; in 1881 it dropped to 1,043; in 1891 it further dropped to 1,029; in 1901 to 1,027; and in 1911 to 1,003; this being the smallest difference in the relative numbers of each sex since Census statistics were first published.

The next slide will illustrate this, because in the upline we get the gradually increasing loss of females through emigration and death, which shows a remarkable increase from the period 1864-1901, followed however by a slight recovery from 1901-11. The transverse line shows the number of females born compared with every 1,000 males, which shows but slight variation in any of the periods covered by the diagram as exemplified by the following table (10):—

TABLE 10.—*Showing the net loss in the number of males and females in Ireland, as indicated by the excess of deaths and emigration over births in the period from January 1, 1864 (when the Act for the registration of births and deaths first came into operation in Ireland) to March 31, 1871, and in each of the decennia ending with March 31 of the years 1881, 1891, 1901 and 1911.*

Periods.	Excess of deaths and emigration over births.	
	Males.	Females.
Jan. 1, 1864, to March 31, 1871	103,017	55,591
April 1, '71 " '81	111,281	88,279
" '81 " '91	239,754	260,437
" '91 " 1901	171,348	141,381
" 1901 " '11	26,649	60,121

In order to show the loss by emigration suffered by the several counties and provinces of Ireland I have constructed a table (11) showing the number of emigrants (natives of Ireland) by sexes, to every 100 of the average population, during the period 1851-1911:—

Counties and provinces.	Number of emigrants to every 100 of average population, 1851-1911.		
	Total.	Males.	Females.
Kerry	123·3	61·5	61·8
Clare	114·8	56·2	58·6
Cork	111·2	57·5	53·7
Tipperary	103·6	53·4	50·2
Limerick	102·4	52·0	50·4
Longford	102·3	51·8	50·5
Galway	96·0	45·6	50·4
Cavan	95·0	48·0	47·0
Leitrim	94·9	46·7	48·2
Waterford	93·8	50·3	43·5
Roscommon	87·3	42·4	44·9
Mayo	84·5	37·6	46·9
King's	80·7	41·5	39·2
Sligo	79·8	37·7	42·1
Queen's	78·2	39·2	39·0
Monaghan	76·6	39·9	36·7
Meath	74·7	39·2	35·5

Counties and provinces.	Number of emigrants to every 100 of average population. 1851-1911.		
	Total.	Males.	Females.
Tyrone	74.5	39.6	34.9
Kilkenny	73.7	38.1	35.6
Carlow	72.1	37.1	35.0
Antrim	69.1	40.0	29.1
Westmeath	68.8	36.5	32.3
Londonderry	68.7	38.6	30.1
Fermanagh	67.8	34.8	33.0
Donegal	66.2	34.9	31.3
Armagh	65.0	36.4	28.6
Down	59.0	35.4	23.6
Wexford	58.6	30.9	27.7
Louth	57.6	28.3	29.3
Kildare	49.6	27.5	22.1
Wicklow	41.9	23.4	18.5
Dublin	28.6	16.0	12.6
Provinces—			
Munster	109.4	55.9	53.5
Connaught	88.9	41.8	47.1
Ulster	68.5	37.8	30.7
Leinster	55.2	29.1	26.1
Ireland	80.9	42.0	38.9

In another pillar diagram thrown on the screen Munster was shown to have the highest emigration return; this is fully borne out by the county rate, shown by this slide, as the four counties having the highest rates are in Munster, viz., Kerry, Clare, Cork and Tipperary. Leinster is lowest, County Dublin being at the bottom of the list, the next lowest being County Wicklow; then follow the Counties of Kildare, Louth and Wexford.

Houses and house accommodation.

The number of inhabited houses in Ireland on the night of the Census of 1911 was 861,879, being an actual increase of 3,721 over the total returned in 1901. This represents an increase of 0.43 per cent., whereas for each preceding decennial period decreases of 1.4, 4.8, 4.9, 3.4, and 4.9 per cent. respectively were shown. During the same decades, reading back from 1911 to 1841, the population decreased at the respective rates of 1.5, 5.2, 9.1, 4.4, 6.7 and 11.5 per cent.

In 1911, as on previous occasions, the houses were classified in four divisions: 1st, according to extent as shown by the number of rooms; 2nd, according to quality as shown by the number of windows in front; and 3rd, according to solidity and durability, as shown by the material of the walls and roof. If numbers be

adopted to express the position of every house in a scale of each of these elements, and if the numbers thus obtained for every house be added together, a new series of numbers will be produced, giving the position of each house in a scale compounded of all the elements, *i.e.*, its actual state. A reference to Form B 1 will show the principle upon which this has been done.

I may say that the Census Commissioners have left a strong recommendation to those who will be responsible for the next Census that certain modifications be carried out as regards this matter.

In the lowest of the four classes are comprised houses built of mud or perishable material having only one room and window; in the third, a better description of house, varying from one to four rooms and windows; in the second, a still better class of house, having from five to nine rooms and windows; and in the first-class, all houses of a better description than the preceding.

In the following table (12) is shown the number of inhabited houses in Ireland, by classes, at each of the eight Censuses, 1841-1911:—

Census years.	Houses of the				Total.
	First class.	Second class.	Third class.	Fourth class.	
1841	40,080	264,184	533,297	491,278	1,328,839
'51	50,164	318,758	541,712	135,589	1,046,223
'61	55,416	360,698	489,668	89,374	995,156
'71*	60,483	381,114	363,042	156,741	961,380
'81	66,727	422,241	384,475	40,665	914,108
'91	70,740	466,632	312,589	20,617	870,578
1901	75,225	521,454	251,606	9,873	858,158
'11	84,406	583,245	189,136	5,092	861,879

* In 1871 a different tabulation was adopted, which accounts for the apparent increase of the fourth class houses, and of the number of families with fourth class accommodation in that year.

It would appear from the foregoing that the number of inhabited houses of the first class rose, during the past decade, from 75,225 to 84,406, an increase of 12 per cent. The second and third-class houses taken together number about the same in the present as in the former Census. The fourth class fell, during the same period, from 9,873 to 5,092, showing a decrease of almost 50 per cent. The number in 1901 again was less than half the number returned in 1891, while compared with the dwellings of this class enumerated in 1861 there are less than 6 per cent. now in existence.

The following table (13) shows for each of the eight Censuses the number of houses of the first, second, third and fourth classes,

respectively, in the "rural" areas (Ireland, exclusive of towns of 2,000 inhabitants and upwards):—

Census year.	Number of houses by classes.			
	First.	Second.	Third.	Fourth.
1841	15,973	198,122	492,809	470,549
'51	22,209	242,515	500,757	130,756
'61	25,822	272,661	450,725	85,793
'71*	28,390	274,977	329,018	148,233
'81	33,441	300,534	352,332	38,804
'91	37,081	326,723	286,452	19,761
1901	38,700	349,662	229,342	9,346
'11	43,109	392,201	170,694	4,828

* See note (*) at foot of table 12.

This slide, framed from the preceding table, exhibits at a glance the changes that have taken place in the position of the four classes of houses occupied by the inhabitants of rural Ireland since 1841. The result, on examination, will be found to be most gratifying; we see that the first class has slightly increased, the second class has made a considerable increase, going up from 20 to almost 39. On the other hand, we find that the third-class has decreased from 50 to 17, and the fourth class from 47 to 1. Even compared with ten years ago, an improvement has taken place, as the first class has gone up from 4 to over 4; the second from 35 to 39; the third class decreased from 23 to 17, and the fourth has also decreased.

The accommodation afforded by the different classes of houses has been arranged under four headings, viz. :—

First-class accommodation, consisting of first-class houses occupied by one family.

Second-class accommodation, consisting of second-class houses occupied by one family, or of first-class houses occupied by two or three families.

Third-class accommodation, comprising third-class houses with one family each, or second-class houses with two or three families, or first-class houses occupied by four or five families.

Fourth-class accommodation includes all fourth-class houses, third-class houses with more than one family, second-class houses with four or more families, and first-class houses inhabited by six or more families.

If we separate the civic and rural areas as regards house accommodation, we find, in 1911, in the rural areas, an average of 1·03 families to each house of the first class, as compared with 1·05 in 1901; the average number for second, third and

fourth classes corresponds with that of 1901, which was 1·01 for second class and 1·00 for the third and fourth classes.

In the civic areas, the average number of families to each house in the first class had fallen during the decade from 1·65 to 1·59; in the second class from 1·13 to 1·10; whereas the third and fourth classes were practically the same at each Census.

The percentage of families occupying first, second, third and fourth-class accommodation in the "rural" districts (Ireland, exclusive of towns of 2,000 inhabitants and upwards) is shown in the following table (14):—

Census years.	Percentage of families in rural areas occupying accommodation of the				Total.
	First class.	Second class.	Third class.	Fourth class.	
1841.....	1·2	15·3	40·0	43·5	100
'51.....	2·2	24·1	51·9	21·8	100
'61.....	2·7	29·8	52·3	15·2	100
'71*.....	4·2	34·0	41·4	20·4	100
'81.....	4·3	40·1	48·9	6·7	100
'91.....	5·3	47·7	43·3	3·7	100
1901.....	6·0	55·2	36·9	1·9	100
'11.....	6·9	63·7	28·3	1·1	100

* See note (*) at foot of table 12.

The slide derived from the foregoing table (14) illustrates the variation in house accommodation since 1841. This also shows progress; as the percentage in the first-class accommodation has steadily increased from 1841 to 1911; the second class shows a remarkable increase from 1901 to 1911 from 55 to 64; and from 1861 to 1911 from 15 to 64. The percentage of the third class increased between 1841 and 1861, but after that steadily decreased, falling from 52 in 1851 to 28 in 1911; while the fourth class fell from 44 per cent. in 1841 to 1 per cent. in 1911.

The following table (15) shows for the "civic" areas of Ireland (towns of 2,000 inhabitants and upwards) and for the City of Dublin, the percentage of families occupying first, second and third, and fourth-class accommodation, according to the Censuses of 1881, 1891, 1901 and 1911:—

Classes of accommodation.	Percentage of families.							
	Civic areas.				City of Dublin.			
	1881.	1891.	1901.	1911.	1881.	1891.	1901.	1911.
1st class	10·0	10·7	10·9	11·8	8·6	9·1	7·8	7·4
2nd and 3rd class	73·9	77·4	78·5	78·7	48·7	53·6	56·0	59·6
4th class	16·1	11·9	10·6	9·5	42·7	37·3	36·2	33·0

From the latter table the next diagram is framed. It will be observed that the first class shows a slow and steady rise from 10 to 12; the second and third combined from 74 to almost 79, and the fourth a fall from 16 to 9. Dublin also shows a fall in the fourth class from 43 to 33, and a rise in the second and third classes from 49 to almost 60. The first class is scarcely altered.

In the following table (16) is shown the average number of persons to an inhabited house, and the average number of persons to a family, at each of the eight Censuses, 1841-1911 :—

Year.	Persons to a house.	Persons to a family.	Year.	Persons to a house.	Persons to a family.
1841	6·2	5·5	1881	5·6	5·1
'51	6·3	5·4	'91	5·4	4·9
'61	5·8	5·1	1901	5·2	4·9
'71	5·6	5·0	'11	5·0	4·7

The next diagram illustrates this table. In 1841 the number of persons to a house was 6·2, and in 1851 it went up to 6·3; from that until 1911 there has been a steady decrease to 5·0.

For the same period the number of persons to a family has decreased from 5·5 to 4·7.

The principal points noticeable in this brief survey of the figures relating to houses and house accommodation are :—

That the average number of persons to each inhabited house is now less than at any previous Census ;

That the actual number of inhabited houses has increased during the last decade ;

That during the same period there has been a further substantial increase in the better class houses, accompanied by a corresponding reduction in houses of the inferior grades.

Tenements.

Reviewing more particularly the tenements of less than five rooms, we find that at the last Census the total number of such in Ireland was 635,310, or about 70 per cent. of the total number in the country. Of these 6 per cent. were of one room, 21 per cent. of two rooms, 25 per cent. of three rooms, and 17 per cent. of four rooms. This compares favourably with the 1901 Census, in which it was found that 682,234 or 75 per cent. of the total number of tenements were those of less than five rooms, 9 per cent. being of one room, 27 per cent. two rooms, 25 per cent. three rooms, and 15 per cent. four rooms. This may be seen by reference

to the following table, which also gives particulars for each of the six county boroughs :—

TABLE 17.—*Showing for the years 1901 and 1911 the number of tenements of less than 5 rooms, and of 5 rooms and upwards, in Ireland and in each of the county boroughs; also the respective percentages of the total number of tenements.*

Ireland. County boroughs.	Census year.	Tenements of					Total tenements.
		1 room.	2 rooms.	3 rooms.	4 rooms.	5 rooms and upwards.	
Ireland	1911	58,334	194,135	228,588	154,253	275,349	910,659
	'01	79,149	242,710	224,769	135,606	227,822	910,056
Dublin	1911	21,133	13,087	6,577	6,475	15,093	62,365
	'01	21,747	13,620	5,971	5,484	12,441	59,263
Belfast	1911	448	3,205	3,898	18,505	51,314	77,370
	'01	697	4,874	5,086	21,351	37,973	69,981
Cork	1911	1,511	3,141	3,169	2,701	4,947	15,469
	'01	1,620	3,671	2,820	2,493	4,651	15,255
Londonderry {	1911	554	681	798	2,196	3,516	7,745
	'01	529	747	850	2,411	2,855	7,392
Limerick {	1911	1,005	1,891	1,256	1,260	2,065	7,477
	'01	1,166	2,277	1,186	935	1,814	7,378
Waterford {	1911	353	768	1,152	1,106	1,761	5,140
	'01	368	908	1,257	976	1,543	5,052

Percentage of total tenements.							
Ireland	1911	6·4	21·3	25·1	16·9	30·3	100
	'01	8·7	26·7	24·7	14·9	25·0	100
Dublin..... {	1911	33·9	21·0	10·5	10·4	24·2	100
	'01	36·6	23·0	10·1	9·3	21·0	100
Belfast	1911	0·6	4·2	5·0	23·9	66·3	100
	'01	1·0	7·0	7·2	30·5	54·3	100
Cork {	1911	9·8	20·3	20·5	17·4	32·0	100
	'01	10·6	24·1	18·5	16·3	30·5	100
Londonderry {	1911	7·1	8·8	10·3	28·4	45·4	100
	'01	7·2	10·1	11·5	32·6	38·6	100
Limerick {	1911	13·4	25·3	16·8	16·9	27·6	100
	'01	15·8	30·8	16·1	12·7	24·6	100
Waterford ... {	1911	6·9	14·9	22·4	21·5	34·3	100
	'01	7·3	18·0	24·9	19·3	30·5	100

Confining ourselves to tenements of one room in both rural and urban districts, we find that there has been a decrease during the decade from 79,149 to 58,334, equivalent to over 26 per cent. Reviewing the six county boroughs, it is seen that, in 1901, 79 per cent. of the total tenements of all kinds in Dublin County Borough were tenements of less than five rooms; this had fallen to 76 per cent. in 1911. In Belfast, during the same period, the percentage had fallen from 46 to 34; in Cork, from 70 to 68; in Limerick, from 75 to 72; in Waterford, from 70 to 66; and in Londonderry, from 61 to 55. During the decade the actual numbers of one-room tenements in the county boroughs diminished by 614 in Dublin; by 249 in Belfast; 109 in Cork; 161 in Limerick; 15 in Waterford; while Londonderry showed an increase of 25.

The next slide is an illustration of the following table for the City of Dublin:—

TABLE 18.—*Showing the total number of tenements of one room, and the number of occupants of each tenement in the City of Dublin in 1901 and 1911.*

Year.	Total number.	Tenements of one room occupied by					
		1 person.	2 persons.	3 persons.	4 persons.	5 persons.	6 persons.
1911	21,133	3,604	5,310	3,893	3,074	2,267	1,488
'01	21,747	3,278	5,544	4,392	3,384	2,302	1,477

		Tenements of one room occupied by					
		7 persons.	8 persons.	9 persons.	10 persons.	11 persons.	12 persons and upwards.
1911	—	854	431	146	45	16	5
'01	—	797	362	145	47	13	6

As regards the number of tenements of one room and the number of occupants of such, this shows a fall in both.

A further slide shows in addition a fall in two-room tenements, a slight increase in three rooms, a further increase in four rooms, and a still further increase in five rooms and upwards.

The next slide shows for the whole of Ireland for each of the years 1901 and 1911 the percentage of occupiers (or heads of families) in occupation of less than five rooms, and of five rooms and upwards, to the total number of families. This shows a whole-some decrease in the percentage of one room and two rooms, a slight increase in three rooms, more of an increase in four rooms, and a still greater increase in five rooms and upwards.

The following table (19) shows for the county boroughs of Ireland the proportion per cent. to the population living in one-room tenements, according to the Censuses of 1901 and 1911 :—

County boroughs.	Percentage of persons in one-room tenements.	
	1901.	1911.
Dublin	24·7	22·9
Limerick.....	8·7	7·9
Cork	5·3	4·7
Londonderry	3·3	3·1
Waterford	3·2	2·9
Belfast	0·4	0·3
Total county boroughs	10·1	9·1
Remainder of Ireland	4·2	2·6
Whole of Ireland	5·3	3·9

The next diagram illustrates the foregoing table (19). Dublin easily heads the list, Limerick comes next, then we get Cork, Londonderry, Waterford, and Belfast, the latter being the lowest. There is an improvement in all, not so well marked for the county boroughs, but a better result for the whole of Ireland. It may here be observed that the total population of the six county boroughs is 875,184, or 20 per cent. of the whole population of the country.

Ages.

The next slide deals with the sexes and ages of our population and is derived from the following table :—

TABLE 20.—*Showing for Ireland the percentage among the male and female population of those under 15 years, 15 and under 35 years, 35 and under 55 years, 55 to 70 years, and 70 years and upwards, at each of the six Censuses from 1861 to 1911.*

Census year.	Percentage of male population.				
	Under 15 years.	15—35.	35—55.	55—70.	70 and upwards.
1861	34·1	35·1	19·0	8·8	3·0
'71	36·8	30·9	18·4	9·8	4·1
'81	36·3	31·7	18·8	8·8	4·4
'91	33·5	33·9	19·2	9·0	4·4
1901	31·3	35·1	19·4	10·0	4·2
'11	30·1	32·7	21·6	9·5	6·1

TABLE 20—*Contd.*

Census Year.	Percentage of female population.				
	Under 15 years.	15—35.	35—55.	55—70.	70 and upwards.
1861	31·5	35·5	20·5	9·2	3·3
'71	34·0	32·7	19·3	9·8	4·2
'81	33·8	32·9	19·5	9·2	4·2
'91	31·5	33·8	21·0	9·1	4·6
1901	29·5	35·4	20·7	10·2	4·2
'11	29·1	32·6	20·9	10·1	7·3

From this we see that 30 per cent. of our male and 29 per cent. of our female population are under 15 years of age; about 33 per cent. of both sexes are between 15 and 35. Going back fifty years, we find that the incidence of the two age-periods has considerably altered, as may be seen by the slide. Between 35 and 55 the male population represents 21·6 per cent. of the male population at all ages, and 9·5 for the next age period; while over 70 they represent 6·1 per cent. The female population for the same age-periods represents respectively 20·9 per cent., 10·1 per cent., and 7·3 per cent. It therefore appears we have more women over 70 than men.

Education.

It has been truly said that the prosperity of a country increases in the same proportion as education advances; that is to say, if education advanced the country must prosper, and if the country is prospering education must be advancing. The result of our last Census shows that education is steadily progressing.

In analysing the attendance at the different classes of schools, it is found that, while there is an increase in the attendance at schools classed as "Primary," there is a more marked increase in the attendance at "Superior" schools, as may be seen from the following table:—

TABLE 20A.—*Showing by sexes the number of pupils in attendance at primary schools and at superior (or intermediate) schools in 1901 and 1911.*

Sexes.	Attendance at primary schools.	
	1901.	1911.
Males	315,513	325,458
Females	321,264	335,694
Total	636,777	661,152

TABLE 20A—*Contd.*

Sexes.	Attendance at superior (or intermediate) schools.			
	Non-resident.	Resident.	Non-resident.	Resident.
Males	17,994	5,051	21,297	6,263
Females	7,891	4,437	8,510	5,087
Total	25,885	9,488	29,807	11,350
	35,373		41,157	

After the 1901 Census it was conceded that 5 years was too young an age at which to consider whether children were illiterate or not, hence 9 years were selected instead of 5; but, in order to keep up a comparison with former Censuses, the number of those between 5 and 9 who could neither read nor write was separately ascertained. The number of illiterates over 5 years of age for 1911 was 471,209, being a percentage of 11·9; and that above the standard age (9) was 331,317. This last number is the number of illiterates in Ireland according to the recent Census, and is equal to 9·2 per cent. of the population, 9 years and over.

In the following table (21) the proportion per cent. of the population of Ireland five years of age and upwards who were returned as illiterate at each of the eight Censuses from 1841 to 1911 is shown:—

Census year.	Percentage illiterate of the population, 5 years and upwards.	Census year.	Percentage illiterate of the population, 5 years and upwards.
1841.....	52·7	1881	25·2
'51.....	46·8	'91	18·4
'61.....	38·7	1901	13·7
'71.....	33·4	'11	11·9

This is indicated by the slide, which shows a steady decline from 53 per cent. in 1841 to 12 per cent. in 1911. As neither in England nor in Scotland is there an “Educational” Census taken, there is no means of comparison in this respect between the three countries.

In Table 21A is shown the state of education of the inhabitants of Ireland, 9 years of age and upwards, in 1911.

TABLE 21A.—*Showing the number and proportion per cent. of the population of Ireland, 9 years of age and upwards, in 1911, who could read and write, read only, and who were illiterate.*

	Population, 9 years and upwards.	
	Numbers.	Proportion per cent.
Read and Write.....	3,154,544	87·6
Read only	115,054	3·2
Illiterate	331,317	9·2
Total	3,600,915	100·0

The next slide shows the percentage of children between the ages of 5 and 16 attending school in each of the Census years from 1841 to 1911, and children of the same age not attending school in the same period. These percentages are most gratifying, as the non-attendance has steadily decreased from 80 per cent. in 1841 to 33 per cent. in 1911, while the attendance increased from 20 per cent. to 67 per cent. during the same period. Even during the last decade there was an improvement in these two classes, those who attended school going up by 7 per cent., and this notwithstanding a decreasing population, as will be seen from the subjoined table.

TABLE 22.—*Showing the percentage of the population, 5 and under 16 years of age, in Ireland attending school and not attending school, according to each of the eight Censuses, 1841-1911.*

Year.	Percentages.		Year.	Percentages.	
	Attending school.	Not attending school.		Attending school.	Not attending school.
1841	20·0	80·0	1881	46·5	53·5
'51	25·0	75·0	'91	54·1	45·9
'61	30·0	70·0	1901	60·2	39·8
'71	42·1	57·9	'11	67·1	32·9

The greatest number of attendances that a child could put in at school, omitting the usual, as well as the public, holidays, is about 220. It is satisfactory to note that the number of those who only attended for a small portion of the year, viz., under 20, 60 and 100 days, has decreased; while between 100 and 200 days the attendance has steadily risen from 33 per cent. to 57 per cent. during the last fifty years, and during the last ten years it has gone up from 52 per cent. to 57 per cent.

The table (23) which follows, and from which the slide is derived, shows for Ireland the percentage of scholars in attendance at school under 20 days, 20 and under 60 days, 60 and under 100 days, 100 and under 200 days, and 200 days and upwards, during the years ended March 31, 1861, 1871, 1881, 1891, 1901, and 1911 :—

Year.	Percentage of scholars in attendance.				
	Under 20 days.	20 and under 60.	60 and under 100.	100 and under 200.	200 and upwards.
1861.....	13·6	25·7	19·2	32·6	8·9
'71.....	14·9	24·9	19·3	31·7	6·2
'81.....	12·5	20·2	17·5	43·0	6·8
'91.....	11·0	16·9	14·9	51·4	5·8
1901.....	9·8	15·6	15·2	52·2	7·2
'11.....	7·6	14·4	13·4	57·4	7·2

Irish language.

The next diagram shows, by sexes, the number and proportion per cent. of those in attendance at school in Ireland who were learning Irish, according to the Censuses of 1881, 1891, 1901 and 1911, and the following is the table (24) from which it is derived :—

Sexes.	Pupils learning Irish.							
	1881.		1891.		1901.		1911.	
	Number.	Proportion per cent.	Number.	Proportion per cent.	Number.	Proportion per cent.	Number.	Proportion per cent.
Males	1,029	0·3	1,122	0·3	24,041	7·0	86,820	24·4
Females ...	276	0·1	314	0·1	12,079	3·6	79,955	22·9

Taking the males and females, we find that there is very little difference in 1891 as compared with 1881, and that in 1901 the number of males attending school who were learning Irish had gone up to 7·0 per cent., whereas the females had only reached 3·6 per cent. ; at the last Census, however, the percentage had gone up to 24·4 per cent. for males, and 22·9 per cent. in the case of females. This means that, in numbers, it has gone up from 1,029 in 1881 to 86,820 in 1911, for males, and for females from 276 to 79,955 during the same period. The lessons to be learned from this diagram are, I need hardly say, most satisfactory.

The following table (25) shows for Ireland, according to the Censuses of 1901 and 1911, by ages and sexes, the number of Irish speakers in every 100 of the male and female population :—

Ages.	Percentage of Irish speakers to population.			
	Males.		Females.	
	1901.	1911.	1901.	1911.
3 and under 10 years	4.9	5.5	4.8	5.6
10 " 18 "	10.8	15.3	10.3	16.4
18 " 30 "	13.8	11.5	11.5	10.7
30 " 60 "	19.2	16.0	18.0	12.8
60 years and upwards	33.0	27.4	30.7	25.4
Total 3 years and upwards ...	15.8	14.3	14.8	13.8

From the preceding table I have constructed a diagram which shows the greatest proportion, both in males and females, of Irish speakers, as belonging to the ages of 60 years and upwards. The next greatest is for males, between 30 and 60 in 1901, and for the same age-periods for females in the same Census; for males in the last Census, 1911, the second highest percentage came also between these ages, while for females the second highest referred to the age-period 10 and under 18 years.

In the following table (26) are shown for Ireland and for each of the four provinces the number and proportion per cent. of the population who could speak Irish, as returned at each of the four Censuses from 1881 to 1911:—

Irish speaking population.								
	1881.		1891.		1901.		1911.	
	Number.	Pro- por- tion per cent.	Number.	Pro- por- tion per cent.	Number.	Pro- por- tion per cent.	Number.	Pro- por- tion per cent.
Ireland . . .	949,932	18.2	680,245	14.5	641,142	11.4	582,416	13.3
Provinces—								
Leinster....	27,452	2.1	13,677	1.2	26,436	2.3	40,225	3.5
Munster....	445,766	33.5	307,633	26.2	276,268	25.7	228,694	22.1
Ulster ...	110,523	6.3	84,152	5.2	92,858	5.9	96,440	6.1
Connaught	366,191	44.6	274,783	37.8	245,580	38.0	217,087	35.5

Examining for each province, and then Ireland as a whole, as shown by the slide, we find that for all Ireland there has been a decline; for Munster and Connaught a marked decline; in Ulster an increase, and in Leinster a considerable increase.

It must be borne in mind that in dealing with these subjects emigration materially alters the normal condition of affairs.

Occupations.

Ireland being essentially an agricultural country, it is not surprising to find the greater number of its inhabitants returned as engaged in purely agricultural pursuits.

Examining the occupations for all Ireland according to sexes, we find that the number returning themselves as following specified occupations among persons 15 years and upwards has declined during the last twenty years from 93 per cent. to 90 per cent. among the males; and that the non-productive class has risen from 7 per cent. to 10 per cent. There seems to be a greater proportion of decrease of those returning themselves as following some specific occupation among the female sex, as within the last ten years those who have returned themselves thus have declined from 34 per cent. to 27 per cent.; while the non-productive class has risen from 66 per cent. to 73 per cent. Of course, the effect of emigration, inasmuch as more females are emigrating than males within the last few years, must also be taken into consideration.

The figures here referred to are set forth in the following table (27), showing the percentage to the total number of males and females aged 15 years and upwards who were returned at the Censuses of 1891, 1901, and 1911 as engaged in specified occupations, and of those belonging to the indefinite or non-productive class:—

	Percentage of population aged 15 years and upwards.					
	Males.			Females.		
	1891.	1901.	1911.	1891.	1901.	1911.
Persons of specified occupations	93·1	92·3	89·9	33·1	33·7	27·1
Indefinite and non-productive class	6·9	7·7	10·1	66·9	66·3	72·9
Total	100·0	100·0	100·0	100·0	100·0	100·0

Miscellaneous.

As regards poor law relief, the following table (28) shows for Ireland the rate per 10,000 of the population represented by the number of persons relieved under the poor law system (distinguishing inmates of workhouses from those in receipt of out-door relief) according to the Censuses of 1881, 1891, 1901 and 1911:—

Nature of relief.	Persons relieved.			
	1881.		1891.	
	Number.	Per 10,000 of population.	Number.	Per 10,000 of population.
In workhouses	55,830	10·8	42,348	9·0
On out-door relief	61,233	12·4	62,988	13·4
Total	120,063	23·2	105,336	22·4

Nature of relief.	Persons relieved.			
	1901.		1911.	
	Number.	Per 10,000 of population.	Number.	Per 10,000 of population.
In workhouses	42,932	9·6	38,318	8·7
On out-door relief ...	58,365	13·1	38,871	8·9
Total	101,297	22·7	77,189	17·6

It will be seen from the slide constructed from this table (28) that in 1881 there were 120,000 returned as being in receipt of poor law relief, whereas in 1911 that number had fallen to 77,000, a decrease of nearly 43,000 or 36 per cent. in thirty years. The diagram also shows the proportion between the inmates of workhouses and those of out-door relief. The percentage of those in workhouses has fallen from 10·8 in 1881 to 8·7 in 1911, and for those on out-door relief from 12·4 to 8·9 in the same period. You will observe that in the intervening years the proportion of those who were on out-door relief had increased in 1891 and 1901, whereas there was a marked decrease in 1911. This, no doubt, is in a great measure due to the old age pensions, which every one agrees have been such a boon to many respectable people who were not anxious to be considered as coming under the poor law.

I will now rapidly show four slides. The first one illustrates that after all Ireland is not a bad country to live in, as exemplified by the following table :—

TABLE 29.—*Showing the birthplaces of the persons enumerated in Ireland in 1841, 1851, 1861, 1871, 1881, 1891, 1901 and 1911, together with their percentages to the total population thereof.*

Census periods.	Birthplace.				Total of Ireland.
	Ireland.	Great Britain.		Born abroad.	
		England and Wales.	Scotland.		
1841.....	8,140,516	21,552	8,585	4,471	8,175,124
'51.....	6,501,658	34,454	12,312	9,961	6,558,385
'61.....	5,720,563	50,761	16,861	10,379	5,798,563*
'71.....	5,306,757	67,881	20,318	17,010	5,411,966†
'81.....	5,062,287	69,382	22,328	19,535	5,173,532‡
'91.....	4,581,381	74,523	27,323	21,330	4,704,557§
1901.....	4,326,947	76,977	30,101	24,602	4,458,627||
'11.....	4,233,182	90,237	38,486	28,171	4,390,076¶
Proportion per cent.					
1841.....	99·57	0·27	0·11	0·05	100
'51.....	91·14	0·52	0·19	0·15	100
'61.....	98·66	0·87	0·29	0·18	100
'71.....	98·05	1·25	0·38	0·32	100
'81.....	97·85	1·34	0·43	0·38	100
'91.....	97·39	1·58	0·58	0·45	100
1901.....	97·04	1·73	0·68	0·55	100
'11.....	96·43	2·06	0·87	0·64	100

* Exclusive of 403 persons at sea on Census night.

† Exclusive of 411 persons who were born at sea.

‡ Exclusive of 1,047 persons—326 in Cork County, and 721 in Antrim County—whose birthplaces could not be ascertained; also of 251 persons who were born at sea.

§ Exclusive of 191 persons who were born at sea.

|| Exclusive of 148 persons who were born at sea.

¶ Exclusive of 143 persons who were born at sea.

It will be observed from the slide that there is a slight decline in the percentage of persons born in Ireland, which, however, is made up by the increase of those born in and coming from Great Britain and from abroad.

The next slide shows the rate per 10,000 of the population represented by the number of blind in Ireland from 1851 to 1911. Comparing 1911 with 1851, we must admit there is a marked improvement. The same observation, although not in so marked a degree, applies to the deaf and dumb, especially as compared with the year 1861.

The last slide of this series shows in a pillar form what the Inspectors of Lunacy are constantly drawing attention to in their

annual reports, viz., the steady and alarming increase of lunacy. It is seen from this slide that for the past fifty years the rate has gone up per 10,000 of the population from 24·3 to 64·8. It is only right to say that this feature is not confined to Ireland. The same is found in Great Britain and other countries.

These last three slides are compiled from the subjoined table:—

TABLE 30.—*Showing the number and proportion per 10,000 of the population of the blind, the deaf and dumb, and the lunatics and idiots in Ireland enumerated at each of the seven Censuses from 1851 to 1911.*

Census years.	Blind.		Deaf and dumb.		Lunatics and idiots.	
	Number.	Rate per 10,000 of population.	Number.	Rate per 10,000 of population.	Number.	Rate per 10,000 of population.
1851 ..	7,587	11·6	5,186	7·9	9,980	15·2
'61	6,879	11·9	5,653	9·7	14,098	24·3
'71	6,347	11·7	5,554	10·3	16,505	30·5
'81	6,111	11·8	5,136	9·9	18,413	35·2
'91	5,341	11·3	4,464	9·5	21,188	45·0
1901	4,253	9·5	3,971	8·9	25,050	56·2
'11	4,312	9·8	4,010	9·1	28,437	64·8

The Census (Ireland) Act, 1910, for the first time, required an account to be taken “of the duration of marriage and the number of children born of the marriage and the number of such children living.” The principal reason for the introduction of this new inquiry was the remarkable decline of the birth-rate both in Great Britain and on the continent. As may be seen from this slide, the information obtained has been tabulated according to the areas, as shown in the following table:—

TABLE 30A.—*Showing for Ireland and the principal urban areas the average number of children born alive, the number of such living, and the number who have died to a family, being the results of the inquiry regarding marriages in the Census of Ireland, 1911.*

Areas.	Average number to a family.		
	Children born alive.	Children living.	Children who have died.
Six county boroughs	3·84	2·95	0·89
Dublin registration area	3·69	2·82	0·87
Belfast county borough	3·72	2·93	0·79
Whole of Ireland	4·09	3·43	0·66

As the corresponding statistics for England and Wales and Scotland are not yet available it is not possible to institute

a comparison with those countries, but it may be observed that among the families, relating to the *present* marriages up to thirty-five years in duration, dealt with in the Census tables, the average number of children born alive to a family in Ireland as a whole, viz., 4·09, is greater than that for any of the larger urban areas in Ireland. Similarly, the average number of children, for the whole of Ireland, living, is greater than that for any of those areas, while the average number of children to a family who have died is less. These facts show, as might be expected, that in the rural portions of the country larger families, on the whole, are to be found, and that a greater proportion of their members survive.

Summary.

The principal points brought out in this brief survey of the Census of Ireland, 1911, are :—

As regards population	a decline which is the smallest on record.
As regards emigration	a decrease in the number of emigrants.
As regards houses	an actual increase in number.
As regards house accommodation	a general improvement.
As regards poverty	a decrease.
As regards lunacy	an increase.
In addition, the death-rate during the ten years shows a decrease.	

DISCUSSION *on* SIR WILLIAM THOMPSON'S PAPER.

SIR ATHELSTANE BAINES, in proposing a vote of thanks to Sir William Thompson, said that it was only an old census-taker who could really appreciate all the trouble it must have given the author of the Paper to collect all the material which he had so successfully laid before them. He thought that Ireland generally, and Sir William Thompson in particular, were to be congratulated upon the results of the census in more ways than one. First of all, there was the outstanding fact that the great decline in population since 1845 had been stayed at last. The population had reached an almost stationary condition, which was certainly a better sign than the downward movement which had been continuous for so many years. The improvement, too, in education and housing was a matter for hearty congratulation. *Per contra*, the tide of emigration had not been entirely stayed, and the influence of that movement was traceable, he feared, in not only the economical but also in the vital statistics of the country. The author had referred to several points in which the

later figures showed that influence. The question of house accommodation was one, as the proportionally large decrease in the number of lower class dwellings was due, no doubt, in great measure to the decrease of the poorer or emigrating population from those parts of Ireland where that class of house is specially prevalent. He was not certain whether the great improvement in education was not attributable in part to some change in policy or system, which had influenced the studies and the attendance at schools. Reverting to the cardinal question of emigration, he thought that most of them had been struck by the change in the character of the outward movement which had taken place during the last twenty years, to which the author had drawn attention. Up to that period the emigration had been largely the displacement of families, now it was that of individuals. The latter might have as detrimental an effect upon the population as the former. For instance, there was a great increase in the proportion of females emigrating, particularly of those of reproductive age, which he had been told was due to the substitution of Irish for Scandinavian girls in the domestic service of the United States. The statistics of age suggested one or two serious questions. The proportion of adults of both sexes between the ages of 15 and 35 or 45 was one of the highest in Western Europe in spite of the losses by emigration. The number of births to married women of those ages was considerably above the average. Infantile mortality, moreover, was remarkably low, and the death rate in general had been practically stationary for many years. Instead, however, of these conditions resulting in a high rate of natural increase they were neutralised by the extraordinary low marriage rate. The illegitimate birth rate, he would remark in passing, was by far the lowest in the west of Europe. Thus, the reduction of the reproductive element in the population caused by emigration did not reduce the proportion borne by that section of the community to the total, owing to the paucity of the younger population, which outweighed it. Even, then, if emigration were to cease, unless the Irish people married more, their rate of increase would still take an unusually long time to fill up the country. The only other point in the age-returns to which he would refer was the remarkable and sudden growth of the population over 70 in the last ten years. He had no doubt that this point would receive the attention of some one of those who would follow him in the discussion.

Dr. DUDFIELD, in seconding the vote of thanks, said he could not claim to be in any way an expert on census taking, but he could congratulate the author on the interesting character of his Paper, which was full of information. A measure of praise was due to the Irish Census Office for the prompt publication of the eight voluminous tables, which Sir William Thompson stated had been issued within two months of the taking of the census. The office was also to be complimented for their boldness in including within the scope of the census such information as religious persuasion, education and the use of the Irish language. Incidentally, he might say that he would like to know what was the test of ability

to speak Irish. Was any standard prescribed? It was satisfactory that the last census disclosed a check in the rate of depopulation of the country. With regard to the transfer of population from the rural to the town districts mentioned in the table on page 640, he had worked out the index-numbers for the first and last years mentioned. Taking the population in each case enumerated in 1841 as 100, the numbers in 1901 became 201 in the urban areas and 78 in the rural. He could not understand the figures given on page 644, as they suggested that in certain cases more persons had emigrated than lived in the districts. For example, 123 persons had—according to the table—left County Kerry for every 100 inhabitants. It was usually said that one could not get a quart into a pint pot, but Sir William Thompson appeared to have taken more than a quart out of the pint pot. Doubtless some explanation could be given. “Housing” was a subject in which the speaker, as a medical officer of health, was much interested. He noted that with a decreasing population there was better housing, a fact which he had already observed in such of the English census returns as he had had an opportunity of examining. Sir William Thompson had made use of the term “inhabited house,” one which the English office had practically given up. Sir William Thompson had not given any meaning to the term. Doubtless it had been used in the old sense. As to the classification of houses, the author had spoken disparagingly of the first formula, but it appeared to him (the speaker) that a classification somewhat on the lines described might be adopted with advantage by the English office, as such a classification would convey a better idea of the housing conditions than did the tabulation of mere numbers counted. The decrease in the numbers of houses of the lowest classes (3rd and 4th) was most satisfactory. He could have wished to have seen more improvement in Dublin, the part of the country which he knew best. When working at the Rotunda Hospital in 1883 and 1884 he had been in what were originally good houses converted into very inadequate tenements. In some cases large rooms cut up by wooden partitions into three or four small rooms, each of which was occasionally the home of a separate family. The birth-rate in Ireland had remained constant and high, and it was, therefore, somewhat curious that there should be a decrease in the average per family. For the same reason it was difficult to understand the changes in the proportion of the population under 15 to total population. The table of emigrants by ages showed that the greatest incidence of emigration was at ages over 15. Moreover, there had been a reduction in the proportion of the persons under 15 among emigrants during recent years. Taking that fact and the constant birth-rate, one might reasonably have expected higher, not lower, proportions at ages 0—15 in the population. The percentages of women aged 15 years and upwards not engaged in productive employments was exceedingly high, doubtless because of the large proportion of married women. Such women were, however, taking their indirect share in productive occupations, and it always appeared to him hard on the women to classify, say,

the wives of carpenters among the unoccupied, or non-productive workers. Some explanation appeared to be necessary with regard to the table of infirmities. The numbers of deaf and dumb rose from 1851-71 in the latter decennium very rapidly, as appeared from the diagram shown on the screen. Since 1871 the numbers had decreased. If there had been no change in classification made in the Census Office the sudden increase at the census of 1871 could only be explained by changes made by the persons filling the census schedules. He had been shown, that afternoon, in one of the census volumes of 1911 a table which he thought might be adopted by the English office. The table gave the numbers in workhouses, &c., with a classification of the inmates, as well as a mass of useful information as to sickness, &c. Such tables had been issued in the Reports since 1861.

Mr. JESSE ARGYLE heartily thanked the author of the Paper for so admirably summarising the results of what a previous speaker had called the voluminous Census of Ireland. With very great respect, he submitted that the Irish Census was a little too voluminous; it was a little overburdened with detail. He did not know what the opinion of Sir William Thompson might be on that point, but he had looked at the last volume of 1911 of the Census of Ireland, and had turned up the tables for all Ireland, showing the ages, religious professions, and so on. In that table quite a large number of headings were devoted to occupations in which there were less than 6 persons employed in all Ireland. Sometimes there was actually only 1 person employed, and yet a separate heading was given to it. If one followed that out in the county tables he thought it would be found the same thing prevailed, that they actually got a great number of headings with columns arranged for numerous details of occupations in which practically no one was employed. He supposed it was due to the desire to arrive at uniformity with the rest of the United Kingdom. If so, it seemed to him that uniformity might be rather overdone, because he could not see from any point of view that any good purpose was served. There was nothing gained in the way of a comparison with previous censuses, because these were generally occupations in which there had never been anybody employed in Ireland. The table at the bottom of page 658 showed there had been a very considerable increase in the proportion of the indefinite and non-productive classes. He suggested that possibly that increase was more apparent than real, and that it might turn largely on the different method of tabulating the census results. For instance, if they took the case of the females, it used to be the practice in the Censuses to return young women who were employed in housework assisting their mothers, or aunts, or whatever the case might be, as being occupied either in domestic service or in farm work. There had been a change later by which those girls were not considered to be employed, any more than were the wives. As the last speaker had said, probably it was a grievance that all wives not in a specific trade were relegated to the unoccupied class, and that had been followed largely by relegating the daughters, nieces, and so on,

employed in household work, &c., to the unoccupied class. If so that would largely affect the figures. It used also to be the practice to count undefined students as being occupied. Then there was a change, and these students were considered to be unoccupied; so that a transfer of that kind, either for males or females, would no doubt add considerably to the proportion of the non-effective or non-productive class.

Mr. FLUX congratulated Sir William Thompson on the Paper, and on his adoption of the lantern slide. He said that some of the remarks made by Dr. Dudfield and the last speaker led him to refer to the Census Committee which the Society had appointed five years ago and which sought to secure a greater degree of uniformity of census returns within the United Kingdom and throughout the British Empire, and also urged the preparation of certain extra material, included in which were the new tables relating to the fertility of marriages. One could have wished that Sir William Thompson had found time to guide them through that part of the Census Report, instead of having to condense his remarks into some 15 or 20 lines. To refer only to the general summary of these new data, the proportion of the marriages which had endured for periods up to 35 years and were childless came out at about 17 per cent., and did not appear to differ very much between Ireland as a whole and the County Boroughs, which was somewhat unexpected. The inclusion of these new particulars in the Census Reports was a matter for general congratulation. They would, doubtless, prove a mine of useful information. There was another point in which the Census Committee would have been glad to see its work fruitful, viz., in securing greater uniformity, not as the last speaker had suggested, by getting a great many occupation headings in which few or no persons were shown, but in classifying the occupations that were shown in such a way that not only for Great Britain, but also for the United Kingdom, it might be possible to obtain the total of persons who were engaged in productive occupations as distinct from the persons engaged in dealing. One regretted that the authorities of Ireland had not been able to take that little step while having taken the greater step of securing the fertility data. As the Registrar-General was present, he thought it would be a pity if they did not press on his attention the fact that the Society, through the Census Committee, had striven to secure uniformity at any rate within the bounds of the United Kingdom, and to urge upon him to use his influence in that direction when the next census was being taken. The Paper was full of figures which raised side issues not less interesting than the Paper itself. He thought he might suggest that Dr. Dudfield had overlooked the heading at the top of Table 11. The figures in that table showed the aggregate number of emigrants in sixty years compared with the average population during those years. The highest figures, therefore, showed an average of 2 per cent. of the population leaving annually, which was quite possible without exhausting the population. In connection with that, there were

some figures in Tables 9 and 10 which he confessed at first sight were something of a puzzle to him. In Table 9 it was shown that in the year 1871 there were 5 per cent. more females than males in Ireland. In the decade from 1871 to 1881, Ireland lost, according to Table 10, as the balance of the natural increase and of emigration, fewer females than males. One would suppose, therefore, that the percentage of females would grow; but, on the contrary, it decreased. It fell from 5 per cent. excess to 4·3 per cent. excess. A similar thing happened again between 1891 and 1901. That was a relation of figures that certainly must be admitted to be puzzling. One's arithmetic seemed to be going wrong. He thought what really happened was that there was some confusion about the word "emigration." In speaking of loss by emigration, reference was sometimes made to the individuals who were leaving the country with the intention of stopping away from it, and sometimes to the balance of population lost, taking immigration into account. The emigration of which the reader of the Paper was speaking was a gross emigration of natives, and even in regard to this all the figures available were not quite consistent. Table 1 showed a loss of population between 1871 and 1881 of 237,541, while Table 29 showed a decrease in resident natives of Ireland amounting to 244,470, while Table 10 accounted for a loss of 199,560 only. Comparison with Table 1 suggested that the deficiency in Table 10 was mainly among the females during the decade in question. Similarly, in the decade 1891 to 1901, Table 1 showed a loss of population of 245,975, and Table 29 showed a decrease of 254,434 resident natives, while Table 10 recorded a loss of 312,729. In this case there was an excess of loss in Table 10, which was more marked among females than among males. For some time there would appear to have been a not inconsiderable return to Ireland of persons who emigrated earlier, and Table 10 took no account of immigration, whether of natives or of others. Reference had been made by Dr. Dudfield to the ages of the emigrants, and there was certainly some difficulty, at first sight, in reconciling them with the ages of the population. He was inclined to say, however, having looked with some care at that particular point for the last decade, that when the particulars of ages of all emigrants from the United Kingdom which were now collected came to be made up after another census, they might be well content if as great consilience were found between these and the census data as in the case of those given by Sir William Thompson for Ireland for the last intersensual period. He referred to a conclusion which might be drawn from the figures of density of population. It would appear from these figures as if thirty years ago there were 5 million acres of uncultivated land in Ireland, which had been reduced by as much as 2 million acres in the intervening years. If that were a correct interpretation of the figures, he thought it was a point on which the Irish Administration must certainly be highly congratulated. He asked Sir William Thompson if he could explain whether there was any change in the basis of the statistics of unoccupied females, or of unoccupied persons generally. The startling change in the figures, even more startling

than the change in the proportion of persons over 70 years of age, was a thing which led one to inquire whether there had been any traceable difference in the basis of classification, or whether it was an accident for which the authorities could give no explanation.

Mr. YULE said he wished to deal principally with one point, which had been touched on already by more than one speaker, namely the great increase in the proportion of persons over 70 years of age. He had been looking at the figures in the Census Report, and he confessed the more he had looked into them the more he had been puzzled as to the explanation of the facts. There had been a great increase both in males and females over 70 years of age, principally in the age group 70—80. In the Census of 1901 there were only 67,000 males in that age group, but in the Census of 1911 there were 111,000. In the earlier Censuses of 1891, 1881 and 1871 the numbers were 73,000, 80,000 and 81,000. With regard to the females the figures were very similar, but even more striking. There were 134,000 females between the ages of 70 and 80 in 1911, but only half that number, 67,000, in 1901, and about 77,000 in 1891. In the text of the Report of the Census of Ireland it was suggested that the Old Age Pensions had formed a stimulus to the people to find out their correct ages, and hence these increased numbers. It was a gracious and kindly theory to account for the facts, but of course it was not the theory that first occurred to people with unpleasant minds, who thought that the granting of Old Age Pensions would operate in a different way. Going into the figures a little further, it looked to him as if the growth in the numbers returned between 70 and 80 years of age was not so very easily accounted for either by a substitution of truth for falsehood or a substitution of falsehood for truth, or a substitution of direct and intentional falsehood for merely casual falsehood. The figures were very odd indeed. He had taken the percentage of the numbers in the age group 70—80 in 1911 on the numbers in the corresponding age group (60—70) in 1901, and so on for earlier Censuses. For the Census of 1911 the percentage of males 70 to 80 on males aged 60 to 70 in 1901 was 75 per cent.; in 1901 the corresponding figure was 49 per cent. only; in 1891, 47 per cent.; in 1881, 46 per cent. For females the corresponding figures were—in 1911 90 per cent., at the three earlier Censuses, 47 per cent., 45 per cent., and 43 per cent. Assuming that the great excess of apparent survivors in 1911 was due to people telling wilful stories with the view of getting Old Age Pensions, there should be a deficiency in the age groups preceding. But taking the age group 60—70, the percentage of males in 1911 on males aged 50 to 60 in 1901 was 77, and at the three earlier censuses the corresponding percentages were 77, 73, and 72. There was no sign of any marked deficiency at all. For the females the percentages ran 74, 74, 72 and 72. There was nothing surprising about this age group and no apparent deficiency in 1911. There was something surprising, however, if they split the group into the two quinquennial periods 60—65 and 65—70. On doing that, it was found that there had been a shifting in the age group from the

younger to the older half. The number of males aged 65 to 70 in 1911 was 90 per cent. of the males aged 55 to 60 at the previous census, and for women they got exactly the same sort of figure. There was a corresponding deficiency accordingly in the group aged 60—65, but taking the group 60—70 as a whole it would not look as if there had been a transfer from the class 60—70 to 70 and upwards. Taking the age group 50—60 similarly there seemed to be no deficiency in 1911. The percentages ran 81, 81, 80, 80, for males, and 76, 80, 78, 77, for females. Where then did these possible Old Age Pensioners come from? They may have shifted up from lower age groups to some slight extent, but the shift must be a big one to account for the facts. They had to account for some 67,000 additional females and some 44,000 additional males. He would like to ask, therefore, whether there was any evidence that there had been an increased return of people qualified for Old Age Pensions from England, from the States, or elsewhere. Probably there was always a certain amount of normal return.

Sir WILLIAM THOMPSON said not to any considerable extent.

Mr. YULE, continuing, referred to the fertility data concerning which Mr. Flux had also spoken, and pleaded for some further analysis of the data in the future census reports of which he hoped Sir William Thompson would have the direction. He would have liked to have seen some analysis of the fertility data, not merely by duration of marriage, age of husband and wife, and so on, but, for example, by religion and by occupation of husband. He would also have liked to have seen some of the lessons of the present analysis drawn in the text of the Report, some indication, for example, of such features as the change in the percentage of the children surviving with the size of family, age of wife at marriage, and age of husband, and so on. He thought the figures would gain by being emphasized in that way in the text of the Report.

Mr. MACROSTY said he had had occasion to study the tables relating to the occupations of the people, and wished to have much more information than was at present given. He was sure Sir William Thompson would be the first to recognise the necessity of having the occupation censuses of the three divisions of the United Kingdom on the same basis, and as there were such wide differences between the Irish census and the English and Scotch censuses, he could only assume the Irish Census Office must have found themselves fettered either by some legislation or by some other obstructive force. He hoped the Society would re-appoint the Census Committee before the next census, and would reinforce Sir William Thompson in getting all three censuses on the same basis. The main thing was that one wanted to get a distinction drawn, not only as Mr. Flux said between the maker and the dealer, but also between employers and employees. He wished that a tabulation similar to that in the English and Scotch censuses could be introduced in future into the Irish census occupation

returns. It would save students the trouble of making incorrect estimates as to what the actual wage-earning population of Ireland was. He again pleaded for some slight alterations in the classification of the occupations. He thought it was unsound to include army and navy pensioners amongst "occupied" persons, or to classify students as "occupied" in the group of "literary and scientific" persons. Again, he thought it would be an improvement if fishermen were not included in the class of "persons engaged about animals." It hardly seemed to be the proper place for a fisherman to be in the same group with cattle drovers, gamekeepers, vermin destroyers, and cat's meat men. He hoped Sir William Thompson would extend the short section which he had devoted to occupations, and deal with the remarkable shifting of occupations between the last two censuses. Despite the slight decline in the total population, and in "persons of specified occupations and conditions," the numbers engaged in commerce and transport, and in the professions had gone up, but agriculture had gone down very much. The industrial classes had gone up slightly with regard to males, and fallen heavily with regard to females. The male population under 20 employed in industries had gone down 8 per cent., and over 20 had gone up 10 per cent. Did that mean a declining supply or did it mean that young persons were staying longer at school? He also wanted to know whether as between classes there had been some change which looked like a shifting of occupation but which was really due to a different classification. The total number of males in the industrial class had gone up 28,000, but "general labourers" alone had increased by 32,000 between the last two censuses. He thought that point required some further explanation. He also pressed the point as to the "indefinite and non-productive" class, because the males over 20 had gone up some 28,000, which was an increase of about 42 per cent., and females had gone up nearly 10 per cent., whereas those of both sexes under 20 showed a slight decline. He asked Sir William Thompson whether, in his opinion, that might not be due to a return stream from other countries to Ireland. If it were not due to that, he could not see on the figures, comparing the last two or three censuses together, where there was any other explanation except some change of classification.

Sir WILLIAM THOMPSON, in reply, said that the Census Commission were very much hampered by the Census Act by the word "only" being put in. It prevented them expanding. They wanted to expand in occupations. He did not see why the same inquiries should not occur in England, Scotland and Ireland. In the last ten years quite a number of industries had sprung up, and in Belfast and the North the industrial population had been expanding; but there they were with tied hands, and they could not increase the queries. They could not do anything except what was done before. As regards the female indefinite class, the daughters and wives of small farmers had put themselves down as of no occupation, which, to a considerable extent, would account for the numbers included in the indefinite class. They had only to

take the figures from the forms that were filled up and sent to them. For instance, in the A form, there was a column for occupation, and if that were left blank they had to tabulate the individual to the indefinite class. He thought that accounted for a great deal. In Ireland they had a separate Census Act to the Act in England and Scotland, and the census was taken in a different way. If he had anything to do with the putting forward of the next census he would certainly urge equality of information to be sought in the Census Act of the three countries. They had information obtained with regard to religious professions and education in Ireland, and if that were so, he did not see why it should not be also done here. As regards occupations and other things, they certainly did want expanding, but they felt their hands were tied. With regard to Dr. Dudfield's remarks as to Dublin, he thought Dublin was unique compared to the cities of Great Britain in the respect that at one time it was in a very small compass. It was expanding and going out, and the houses that were formerly occupied by the nobility and the better-class people had now changed their character. For instance, the house in which the General Register Office is located was the town house of Lord Charlemont. Many of the houses that were occupied by the nobility before 1800 were now turned into tenement houses. The Corporation had been doing a great deal, also the private philanthropy of Lord Iveagh and Lord Ardilann and Mr. James Talbot Power had improved some of the oldest parts of the City. Still with regard to some of the other larger houses people were leaving and going out to the suburbs, and thus the tenement system still continued. Great work was being done by the Corporation, and he hoped before the next census a very great improvement would be shown in that respect. With regard to age groups, that was not easily explained, especially with regard to those over 70, but there was one fact that they must bear in mind, that they were dealing now with old people of a population of over 8 millions. In 1841 the Irish population was over 8 millions, but now it was less than $4\frac{1}{2}$ millions. He thought that altogether accounted for the greater proportion of old people in Ireland than in England and Scotland. He was sure that the population in England had more than doubled that of seventy years ago, and the same thing applied to Scotland. Therefore, in England and Scotland they were dealing with the old people of half the population they had at the present time, whereas in Ireland they were dealing with double the number. It was true that a certain number of people returned from abroad, but they had no means of getting at the figures. That of course upset the numbers based on births and emigration. They got accurate emigration figures of those going direct from Irish Ports through the Constabulary, who were in the habit of making different official returns.

The following candidates were elected Fellows of the Society:—

Roger Ward Babson.
Israel Horwitz.

Gustavus Taylor Loban.
Paul Sabel.

Ralph F. Wigram.

WORKING-CLASS HOUSEHOLDS IN READING.

By A. L. BOWLEY.

AN investigation was made in Reading, in the autumn of 1912, into the general economic conditions of the working class, by a small unofficial committee. The results are of much more than local interest, since they prove that an inquiry adequate for many purposes can be made rapidly and inexpensively by a proper method of samples. In particular, by classifying earners in relation to dependants, we show the relative numbers of men and of women who have to support families of various sizes (data which hardly exist on any large scale); and further a comparison is afforded in essentials with Mr. Rowntree's well-known study of York. It is already arranged that a similar inquiry shall be made in another town, and it is hoped that, when the simplicity of the method and the importance of the results are appreciated, a sufficient number of people will be interested to carry out investigations in other towns and in rural districts, till we have general knowledge of the economic conditions of the *households* of Great Britain. It is not generally realised that the only information we have at present is that given by the Census as to the number of persons and number of rooms.

A sample was selected from the whole of the present borough of Reading as follows:—One building in ten was marked throughout the local directory in alphabetical order of streets, making about 1,950 in all. Of these about 300 were marked as shops, factories, &c., institutions and non-residential buildings, and about 300 were found to be indexed among Principal Residents, and were so marked. The remaining 1,350 were working-class houses, and a number of volunteers set out to visit every one of these. It was presently found that the scale taken was beyond their powers, and it was decided to take only one house in 20, rejecting the incomplete information as to the intermediate tenths. The visitors were instructed never to substitute another house for that marked,¹ however difficult it proved to get information, or whatever the type of house. In the end we failed to learn anything as to 32 households out of 677, and substituted for these 32 of the surplus tenths, without, so far as can be judged, introducing any bias. Information was entered on cards (as printed on p. 696) by the visitors, and a great deal of supplementary description was written on the back of the cards.

On examination, it proved that in 55 of the 677 the occupier was above the working class (clerk, traveller, shop manager,² &c.), and

¹ Unless the house was unoccupied, in which case the next door was to be taken.

² Grocers' and butchers' assistants were counted as working class, the very small number of married assistants in other shops as of higher status.

these are excluded from all the tables (except the first), which thus deal with 622 households. The first table deals with the 677, together with 163 houses of principal residents.³

The population Census shows (for the present borough) in April, 1911:—

	Number.	Population.
Inhabited dwelling-houses and flats	17,302	78,291
Empty	1,559	—
Inhabited shops.....	1,194	5,377
Hotels, &c., offices, workshops, &c., and } miscellaneous	356	1,614
Institutions	92	2,381
Uninhabited buildings	822	—
	21,325	87,693

At the date of the investigation there were probably about 18,000 inhabited dwelling-houses, of which our first table deals with 840, that is 1 in 21. The *multiplier twenty-one* is then to be applied to all the sample data to give estimates for the whole of Reading.

There are left out of the computations all resident domestic servants and hotel employees,⁴ all resident shop assistants (a not very numerous body in Reading), and some other very small numbers.

It may appear to persons who are not familiar with processes of sampling that a proportion of 1 in 21 is too small for any conclusion, and that in any case not more than a vague probability can be obtained. The theory and method of sampling is discussed in the *Statistical Journal*, 1906, pp. 550—4. It is there shown that the precision of a sample depends not on its proportion to the whole, but on its own magnitude, if the conditions of random sampling are secured, as it is believed they have been in this inquiry. It is demonstrated mathematically that if in our sample 622 working-class households we find respectively 5, 10, 20, 40, 50 per cent. of cases, we may expect⁵ that the percentages in the whole are within 5 ± 1 , 10 ± 1 , $20 \pm 1\frac{1}{2}$, 40 ± 2 , 50 ± 2 , and may be nearly certain⁶ that they are within 5 ± 3 , 10 ± 4 , 20 ± 5 , 40 ± 6 , 50 ± 6 .

³ In the case of principal residents, the rateable values of the selected twentieths were ascertained, and the houses were looked at from *outside* only and their situations marked on the map. It seems probable that they give a fair sample of rateable values and they are only used in the first table.

⁴ The Census of 1901 gives 3,215 indoor female domestic servants over 10 years of age in the then borough.

⁵ Here the standard deviation is used; the chance is about 2 to 1 in favour of the true number being within the limits. Throughout this paper $\pm r$ means that r is the standard deviation.

⁶ Taking the usual assumption that a deviation three times that of the standard, corresponding to a chance of 1 in 250, is beyond ordinary experience.

These results can of course only be depended on when the information is accurate; but conversely, we can test the accuracy of the inquiry in those cases where we know the whole numbers. The following tests go to show that, so far as rent, number of persons to a house, ages and occupations are concerned, our information is very good, but that it is imperfect as regards "other sources of income."

	Number in borough.	Divided by 21.	Number in sample.
Houses rated at 8 <i>l</i> . or less.....	4,380	209	206 ± 12 ⁵
Tenements of less than 5 rooms with more than 2 persons per room in 1901....	114	5.4	8 ± 3 in 1911
Number of public elementary school children between 5 and 14 years (average on register).....	13,604	648	623 ± 24
Occupation A.....	104	5	7 ± 2
" B.....	180	9	8 ± 3
" C.....	250	12	13 ± 3
" D.....	761	36	29 ± 5
" E.....	About 1,250	About 60	54 ± 7
" F.....	About 5,000	About 230	185 ± 14
	(including all males)		(working class only)
Old age pensions ..	1,687	80	43 ± 7
Outdoor relief: } persons }	528	25	*Between 14 and 19 ± 4

* It is doubtful how many persons are officially counted as relieved in the families.

A small number of school children from residential shops are not included in our sample. The occupations include the police, the numbers employed by three large firms who kindly gave us the facts, and the generally reported number employed by the largest firm.

In the following pages the information obtained is analyzed under the headings, housing and rents, family income and rent, earners and dependents, earnings and needs, rates of wages and expenditure.

⁵ See note 5, p. 673.

*Housing and rents.*TABLE I.—*Number of houses and rateable values.*

Rateable values.	Working class.	Others in sample.	Principal residents.	Totals.
—4 <i>l.</i>	4	—	—	4
4 <i>l.</i> —	161	—	1	165
8 <i>l.</i> —	405	39	5	449
12 <i>l.</i> —	30	12	20	62
16 <i>l.</i> —	2	3	23	28
20 <i>l.</i> —	—	—	27	27
24 <i>l.</i> —	—	—	26	26
28 <i>l.</i> —	—	—	14	14
32 <i>l.</i> —	—	—	11	11
36 <i>l.</i> —	—	—	6	6
40 <i>l.</i> —	—	—	4	4
44 <i>l.</i> —	—	—	4	4
48 <i>l.</i> —	—	—	1	1
52 <i>l.</i> —	—	—	3	3
56 <i>l.</i> —	—	—	3	3
60 <i>l.</i> and over	—	—	15	15
Totals	605	54	163	822
Information deficient	17	1	0	18
	622	55	163	840

The rates (excluding water) in Reading in 1912 were 8*s.* in the £. The ordinary rent is 20 per cent. more than the rateable value. The number of houses whose rent is over 30*l.* (40*l.* including rates) appears to be about $75 \times 21 = 1,600$ (approx.).

TABLE II.—*Working-class houses.*

Rent per week.	Number of rooms.								Totals.
	1.	2.	3.	4.	5.	6.	7.	8.	
2 <i>s.</i> to 2 <i>s.</i> 9 <i>d.</i> ..	1	1	2	—	—	—	—	—	4
3 <i>s.</i> „ 3 <i>s.</i> 9 <i>d.</i> ..	—	1	13	3	—	—	—	—	17
4 <i>s.</i> „ 4 <i>s.</i> 9 <i>d.</i> ..	—	—	2	21	3	1	—	—	27
5 <i>s.</i> „ 5 <i>s.</i> 9 <i>d.</i> ..	—	—	—	70	83	1	—	—	154
6 <i>s.</i> „ 6 <i>s.</i> 9 <i>d.</i> ..	—	—	3	28	188	14	—	—	233
7 <i>s.</i> „ 7 <i>s.</i> 9 <i>d.</i> ..	—	—	—	2	80	23	3	—	108
8 <i>s.</i> „ 8 <i>s.</i> 9 <i>d.</i> ..	—	—	—	—	18	11	4	1	34
9 <i>s.</i> „ 9 <i>s.</i> 9 <i>d.</i> ..	—	—	—	—	5	2	4	1	12
10 <i>s.</i> „ 10 <i>s.</i> 9 <i>d.</i> ..	—	—	—	—	1	4	4	1	10
11 <i>s.</i> „ 11 <i>s.</i> 9 <i>d.</i> ..	—	—	—	—	—	3	1	1	5
12 <i>s.</i>	—	—	—	—	—	1	—	—	1
Totals	1	2	20	124	378	60	16	4	605
Median rents*	—	2/6	3/7	5/6	6/6	7/7	9/1	9/9	6/3
Median rent } per room	—	1/3	1/2	1/4½	1/3½	1/3	1/3½	1/0½	1/3

* The “median” rent is that half-way up the scale when the houses are supposed arranged in order of rent, so that the numbers above and below it are equal. Similarly with the median wage, &c., used below.

It appears that 63 (± 6) per cent. of the houses are five-roomed, and that half of these are rented at from 6s. to 6s. 9d.; while 20 (± 5) per cent. are four-roomed houses, of which more than half are rented at from 5s. to 5s. 9d.

The measurements of typical houses at four of the commonest rents are shown in the following table:—

TABLE III.—*Accommodation of typical houses.*

Rent	4s. 6d.	5s. 6d.	6s. 6d.	7s.
Number of rooms	4	5	5	5
Height of ground floor rooms	7 ft. 9 in.	7 ft. 6 in.	8 ft. 2 in.	8 ft.
Average height of first floor rooms	7 ft. 2 in.	7 ft. 9 in.	8 ft. 2 in.	8 ft.
Cubic contents —	c. ft.	c. ft.	c. ft.	c. ft.
Ground floor { Front room	670	630	630	760
Back room	640	680	1,000	1,020
Scullery, &c.	0	470	640	?
First floor { Bedroom	685	1,135	990	1,000
„	575	600	890	780
„	—	1,135	740	680
Total bedrooms	1,260	2,870	2,620	2,460
Garden: breadth	12 ft.	14 ft.	12 ft. 6 in.	12 ft. 6 in.
length	36 ft.	38 ft.	55 ft.	59 ft.

Table IV shows the number of persons in relation to the number of rooms. In 9 cases the Census definition of overcrowding (more than 2 persons to a room) is reached; in 12 cases (shown in heavy type) there is exactly 1 person; in 154, between 1 and 2 persons; and in 434, 1 person or less. In 1901, Reading was among the best of the County Boroughs when judged by this test of overcrowding.

TABLE IV.

Number of rooms.	Number of persons.												Totals.
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	
1	—	1	—	—	—	—	—	—	—	—	—	—	1
2	3	1	—	0	—	—	—	—	—	—	—	—	4
3	4	5	5	1	2	0	2	—	—	1	—	—	20
4	5	25	25	19	18	13	9	5	4	1	—	—	124
5	4	42	83	82	61	50	25	19	7	6	—	1	380
6	—	11	14	10	10	6	4	1	3	—	1	0	60
7	—	1	6	1	2	1	4	—	—	1	—	—	16
8	—	—	—	—	1	2	—	1	—	—	—	—	4
Totals	16	80	133	113	94	72	44	26	14	9	1	1	609 ⁹

The test is, however, a very lenient one. Taking the usual standard of 300 c. ft. to a person for sleeping, both ground floor rooms in the four-roomed house of Table III would have to be used for

⁹ See footnote 9, p. 677.

8 persons, and only 8 or 9 persons could sleep upstairs in the other houses. A new standard suggested⁷ is 500 c. ft. for an adult and 250 c. ft. for a child; this would allow only 3 adults and 4 children, or 2 adults and 5 or 6 children in the five-roomed houses.

Both these tests are arbitrary, and a new and more elastic one has been worked out. In this an adult (including boys over 18 years and girls over 16 years) is counted as 1, other boys and girls over 14 years as $\frac{3}{4}$, children from 5 to 14 as $\frac{1}{2}$, and children under 5 as $\frac{1}{4}$. The household is then reckoned as containing so many equivalent adults. It is then found on examination that 5 equivalent adults can be accommodated in a five-roomed house, allowing 500 c. ft. per adult,⁸ with a little give and take; and one person or less per room on this basis may be regarded as a reasonable standard of sufficiency. Table V is formed on this basis. In 84 cases there is overcrowding on this standard, 27 being in four-roomed and 48 in five-roomed house. In 27 cases (shown in heavy type) the standard is just reached, and in the remaining 498 cases there is more than sufficient room.⁹

TABLE V.—*Number of equivalent adults.*

Number of rooms.	1.	1½.	1¾.	2.	2½.	2¾.	2½.	3.	3½.	3¾.	3½.	4.	4½.	4¾.
1	0	—	—	1	—	—	—	—	—	—	—	—	—	—
2	3	—	—	1	—	—	—	—	—	—	—	—	—	—
3	4	—	—	5	1	—	1	3	—	1	1	1	1	2
4	5	1	—	24	8	13	9	10	11	2	6	8	10	2
5	4	—	1	43	22	31	28	45	23	20	21	34	14	20
6	—	2	—	9	—	6	—	12	6	2	1	4	5	1
7	—	—	—	1	1	1	1	3	1	—	—	1	—	1
8	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Totals	16	3	1	84	32	51	39	73	41	25	29	48	30	23

Number of rooms.	5.	5½.	5¾.	5½.	6.	6½.	6¾.	6½.	7.	7½.	7¾.	7½.	8.	Totals.
1	—	—	—	—	—	—	—	—	—	—	—	—	—	1
2	—	—	—	—	—	—	—	—	—	—	—	—	—	4
3	—	—	—	—	—	—	—	—	—	—	—	—	—	20
4	7	1	1	—	1	2	—	—	—	—	—	—	—	124
5	13	11	7	10	6	2	4	4	—	1	1	2	—	380
6	3	—	—	2	1	—	—	—	—	1	—	—	1	60
7	—	1	—	1	1	1	—	—	1	—	—	—	—	16
8	2	—	—	—	1	—	—	—	—	—	—	—	0	4
Totals	25	13	8	13	10	5	4	4	1	1	2	2	1	609

⁷ *E.g.* Report of Departmental Committee as to Buildings for Small Holdings. Cd.-6708, p. 10.

⁸ Thus, in the 6s. 6d. house of Table III, there might be:—Man and wife in 1 room (2 adults, 1,000 c. ft.), 3 girls, aged 15, 10 and 4, in small room (1½ adults, 750 c. ft.), and 3 boys of school age in the third room (1½ adults, 750 c. ft.). The front ground-floor room is, in fact, frequently used for 1 person, and this would be generally necessary in a four-roomed house.

⁹ In 13 cases the information was deficient.

We have not classified the information collected as to sanitation and water supply, as a complete investigation of suspected houses would be more suitable than a sample inquiry for practical purposes.

Family income and rent.

Table VI shows the relation between rent paid and family income calculated on the basis discussed below. The incomes below 15s. are probably supplemented by charity or poor relief. The proportion spent on rent falls regularly as the income increases, and may appear low to those who are used to computing rent in relation to one adult workman's wages. It is probable that if married clerks and others with an income of 150*l.* to 200*l.* were included, we should find rent (including rates and water) formed a higher proportion than in the case of the higher working-class family incomes. In fact, however, a study of the insufficient incomes dealt with below shows that in Reading other expenditures give way and food is allowed to fall below Mr. Rowntree's standard, while a fairly good house in a respectable street (sometimes with more than the minimum accommodation) is rented. The desire for an adequate garden is so great that many workmen live outside the town (but generally within the recently extended borough) to secure one.

Earners and Dependents.

In the 609 working-class households as to which information is adequate, there are 2,675 persons,¹⁰ of whom 1,075 are earners and 1,600 not. In the remaining 13 houses there are at least 11 men, 2 women and 1 boy earning, but the number of dependants is not known. In subdividing these, ten divisions by sex, age and relationship were made and used with the following abbreviations:—Man over 18 years (m), distinguished as son (s) if living in his parent's house¹¹; woman over 16 years¹¹ (f), distinguished as wife or widow with children (w) if married, and as daughter (d) if living in her parent's house; lad of 16 to 18 years (l); boy of 14 to 16 years (b); girl of 14 to 16 years (g); school-child of 5 to 14 years (sc); child under 5 or infant (in).

We have then the numbers shown in Table VII, p. 680.

¹⁰ Together with 4 lodgers of a non-working class.

¹¹ In some tables we have also made the wage-census division at 20 years for a man and 18 years for a woman.

TABLE VI.—*Family income and rent.*

Rent.	Income.										Totals.
	Under 10s.	10s. and under 15s.	15s. and under 20s.	20s. and under 25s.	25s. and under 30s.	30s. and under 35s.	35s. and under 40s.	40s. and under 45s.	45s. and under 50s.	50s. and under 60s.	60s. and over.
2s. 10	2	3	—	1	—	—	—	—	—	—	6
3s. "	5	7	3	4	3	2	1	1	—	—	26
4s. "	3	4	4	15	10	5	5	1	1	1	52
5s. "	2	3	17	52	24	23	16	9	5	2	154
6s. "	3	6	9	45	42	41	20	19	5	9	215
7s. "	—	—	2	13	13	17	17	10	10	7	95
8s. "	—	—	—	1	2	3	6	—	2	3	21
9s. "	—	—	—	—	—	—	1	2	1	1	6
10s. "	—	—	—	—	—	—	1	3	—	—	7
11s. "	—	—	—	—	—	—	—	2	—	—	4
Totals	15	23	35	131	94	91	67	47	28	11	586
Median income	6s. 9d.	10s. 9d.	18s. 6d.	21s. 9d.	26s. 9d.	31s. 3d.	36s. 9d.	41s. 9d.	47s.	57s.	29s. 6d.
Median rent	4s.	4s.	5s. 6d.	5s. 9d.	6s.	6s.	6s. 6d.	6s. 6d.	6s. 6d.	6s. 9d.	6s.
Rent as per cent. of income	59	37	30	25	22	19	17½	16	14	12	20

Classification of the households is difficult, for, allowing for the 10 sub-divisions and the distinction between earner and non-earner, there are about 260 different groupings in 609 households, as shown in detail pp. 697—9. The statistician's normal family of man (at work), wife (not working) and 3 dependent children only occurs 33 times.

Table VIII shows the main lines of division.

TABLE VIII.—*Earners and dependent children.*

Man only earning.		Man and one or more children earning.		Man and wife earning.†	
Dependent children.	Number of households.	Dependent children.	Number of households.	Dependent children.	Number of households.
0	65	0	62	0	11
1	69	1	26	1	6
2	58	2	24	2	9
3	36	3	26	3	7
4	23	4	13	4	3
5	12	5	7		
6	9	6	4		
7	6				
8	1				
Not known	11				
	290*		162*		36

Other cases where at least one man over 20 years is working.		Women, girls and lads under 20 earning.‡		No earnings.	
Dependent children.	Number of households.	Dependent children.	Number of households.	Dependent children.	Number of households.
0	27	0	32	0	28
1	10	1	7	1	3
2	9	2	3	2	1
3	3	3	2	4	3
4	1	4	2		
5	1	5	1		
7	1				
	52		47		35

* In all cases but 21 the wife is living. There are also 32 adult non-earners in the first group and 21 in the second.

† In 16 cases one or more children are also earning.

‡ One woman only in 26 cases, including 3 with 1 child, 1 with 3, and 1 with 5 children.

A somewhat different classification is given in Table XI, and a more complete one pp. 697—9. Of the 622 houses, 510 are occupied by a man normally at work. In 20 others an adult son is at work, while his parents are past work or ill. In 47 cases a woman is at the head of the house with no adult son. In 7 cases

there are no visible means of livelihood, and in 28 there are old people with pensions or other means.

Of the 688 men and adult sons of Table VII (including also the 11 men in the households there omitted), 510 are heads of households, 50 are lodgers, 34 live with their working mother or non-working parents, and 94 work with their fathers or other men.

It is so frequently assumed, in discussions of the adequacy of wages, that a grown man may be supposed to have a wife and two or more children to support that it is very important to ascertain in what proportion this is the case at any particular time.

To find the largest number, we will assume that their working children and wives do no more than support themselves, and, in fact, children generally do not contribute more than their own expenses to the household, and that where there is more than one man at work the brunt of the children's expenses falls on one only. We then find from Table VIII that out of 688, 153 ($22 \pm 1\frac{1}{2}$ per cent.) have 3 or more children, and 253 (37 ± 2 per cent.) have 2 or more children to support; 111 have 1 child, and the remaining 324 (nearly one-half) have no children.

To find the smallest number, we take those households where a man is the only earner, and we find that only 87 ($13 \pm 1\frac{1}{2}$ per cent.) have 3 or more children, and only 145 (21 ± 1 per cent.) 2 or more children, of whom they are the sole support.

In Reading, among the working classes, practically the whole of the able-bodied men and boys over school age (see Table VII), and the great majority of young women and girls, are normally at work, and this is generally the case in industrial towns. As the age and sex-distribution in Reading is presumably normal, these percentages are likely to apply to towns generally and not to differ much in rural districts, except that there is room for variation in the number of adult women at work.

In considering these numbers, it must be remembered that, besides the families which at a particular moment are of this character, there is a large number who have passed out of this stage by their elder children becoming wage-earners, and another large number who will reach the stage when more children are born; further, the unmarried men may also ultimately reach it. There is no material in existence for showing what proportion of men pass through the stage of having 3 young children to support at some time of their life.

Earnings and needs.

Up to this point we have had no reason to distrust the adequacy of our information; but when we consider earnings in detail we cannot be so confident.

It was not practicable to check the statements as to earnings by reference to the employers, and we have to depend primarily on the accuracy of the statements elicited by the visitors. For married men at work the wage statement was definite in 60 per cent. of the cases, for other men and boys (not lodgers) in 68 per cent., and

¹² Standard deviations, as explained on p. 673.

for unmarried women and girls in 67 per cent. For married women charing or doing laundry- or needle-work at home the statements were generally vague. In many cases we learned both what the man earned and what part he gave for the household; in others we only heard what he gave and added from 1s. to 3s. to obtain his wages. In so small a place as Reading, with its limited occupations, the rates of wages for various kinds of work are common knowledge, and an examination of the wage statements in the light of this knowledge gives every reason to think that they are very fairly accurate. A further guide was afforded by the type of house and the apparent condition of the family. In the case of lads and girls there was seldom much room for doubt. In general there was agreement as to the wages paid for similar occupations. Where there was no definite statement there was nearly always a definite indication of the type of work and general place in the social scale, so that there was nearly always practical certainty within, say, 5s., and a strong probability that the estimate was within, say, 2s. So far as can be judged, there is no general bias either to under- or over-estimate when all corrections were made. The average for men employed by the principal firm agrees with its published statements, so far as comparison can be made. There remains, however, uncertainty in individual cases, and in classifying them, in relation to the minimum standard used, we have taken care to count as above the standard those households as to which there was serious uncertainty.

The following rules were followed in computing the total household earnings: All wages were computed on the assumption that the full normal week, without over- or under-time, was worked, except that persons apparently seriously ill or permanently out of work were counted as earning nothing; for outdoor building trades full time was counted as nine-tenths of summer hours, to allow for winter hours and the effect of bad weather. Day servants and charwomen in private houses were credited with their wage and sixpennyworth of food per day. Where occasional charing or needlework was reported, about two days per week were assumed, if there was no evidence, and charing was counted as 2s. per day. A lodger was not treated as a member of the family; where he was boarded and lodged 2s. of his weekly payment was counted as wife's earnings,¹³ and it was assumed that he also paid one-third of the household's rent; where lodgers simply had rooms and attended to themselves 6d. was counted as wife's earnings and the rest to rent. Old-age pensions and other pensions were included, but not poor relief, nor subsidies from absent children, though the latter were considered to some extent in a few cases in deciding the position relative to the minimum standard. The value of allotments or of garden produce was not included.¹⁴

The incomes so computed are tabulated by amount and compared with rent in Table VI in the 586 cases, where no essential

¹³ But the wife is not counted as employed for the purposes of the Tables.

¹⁴ Where the occupier owned his house, its value was counted as earnings in the table. Thus earnings in some cases would be more correctly called incomes.

datum was missing. The average family income is about 31s. 6d.; one quarter of the households have 22s., or less; one quarter 38s., or more; half are below and half above 29s. 6d.

The incomes being settled, the next question to consider is the expenses to be met. The minimum standard for food, clothing and other purchases sufficient to keep workers efficient and dependants nourished was, as is well known, computed for York in 1901 by Mr. Rowntree.¹⁵ In order to make our returns as nearly as possible comparable with his, the same standard was adopted with three modifications: (1) Prices in Reading in 1912 were about 16 per cent. higher for food than in York at the date he took, so far as can be computed, and his food standard has been raised to 3s. 6d. for a person over 16 years and 2s. 7d. for others. (2) Less coal is used in Reading in the poorer households than in York, some cooking being done by gas; a careful computation results in taking 5d. per week per household off the York standard. (3) State Insurance is added to minimum expenditure.

The diet on which Mr. Rowntree computed his standard is based on the cheapest rations authorised for use in workhouses, and is mainly vegetarian. His minimum assumes perfectly scientific expenditure for obtaining necessary food constituents at the minimum cost. In fact, a workman would sacrifice part of the defined necessities in favour of a meat diet. If we suppose about two pounds of meat bought per week, the additional expense of obtaining the same nourishment may, perhaps, be put at 9d., and the minimum food expenditure for preserving an adult workman in health and efficiency would then be 4s. 6d.¹⁶ A new standard has been computed on this basis. In the York computation all children under 16 years were averaged together, and it seems better to take a more elastic diet as follows:—

TABLE IX.—*Food expenditure basis.* 100 = 4s. 6d.

	Male.	Female.		Male.	Female.
Over 18 years.....	100	80	5 to 14 years	50	50
16 to 18 „	85	80	0 „ 5 „	33	33
14 „ 16 „	85	70	Old age pensioners....	60	50

This gives 1s. 6d. a week, one year with another, for a child under 5, and 2s. 3d. a week on an average for children of school age. The relative scale is akin to that suggested by various authorities. Careful consideration of expenditure and prices in Reading supports the view that these sums spent judiciously,¹⁷ but on the commodities

¹⁵ New light is thrown on the problem by the recent *Report upon a Study of the Diet of the Labouring Classes in the City of Glasgow*. The cost of the necessary food for a working adult man is 3s. 3d. to 3s. 6d. per week in those budgets where the money is spent in the most economic way.

¹⁶ Mr. Rowntree's first scale was 3s. 3d. for a man, 2s. 9d. for a woman, and these were averaged as 3s. for an adult.

¹⁷ If at the co-operative stores, allowance would have to be made for dividend.

usually purchased, would just supply a minimum sufficiency of nourishment.

It is to be noticed that the money standard is higher than Mr. Rowntree's for a man and lower for a young child.

The same scale was taken for sundries on both standards, viz., clothing 6*d.* per week for an adult and 5*d.* for a child, and 2*d.* per head for soap, &c., lighting, and all other household sundries. The minimum standard for typical families would then be on the two bases :—

TABLE X.

	Fuel and State in- surance.	Clothing and sundries.	Food.		Total (excluding rent).	
			York stand- ard.	New stand- ard.	York stand- ard.	New stand- ard.
	<i>s.</i> <i>d.</i>	<i>s.</i> <i>d.</i>	<i>s.</i> <i>d.</i>	<i>s.</i> <i>d.</i>	<i>s.</i> <i>d.</i>	<i>s.</i> <i>d.</i>
Man and wife	1 10	1 4	7 0	8 2	10 2	11 4
Man, wife and two school children	1 10	2 6	12 2	12 8	16 6	17 0
Man, wife and three children under 5 years }	1 10	3 1	14 9	12 8	19 8	17 7
Add for each m	—	0 8	3 6	4 6	—	—
" f	—	0 8	3 6	3 8	—	—
" g	—	0 7	2 7	3 8	—	—
" l	—	0 8	3 6	3 10	—	—
" b	—	0 7	2 7	3 10	—	—
" sc	—	0 7	2 7	2 3	—	—
" in	—	0 7	2 7	1 6	—	—

* These are taken as the same here, since the lower estimate for fuel is nearly balanced by inclusion of insurance. In the tabulations they were kept separate.

We follow Mr. Rowntree in subtracting rent from earnings before comparing with the standard, on the assumption that in cases of poverty the rent is the least possible for adequate housing.

In making comparisons with the standard, it is to be observed that nothing is allowed for insurance (other than State), pocket-money, tram-fares, beer, betting, newspapers, or any of the other ordinary objects of expenditure other than necessities. On the other hand, we do not reckon profit from allotments (which are numerous in Reading,¹⁸ and can provide perhaps a weekly shillings-worth of potatoes, beans, &c., together with less-nourishing vegetables), and have, no doubt, omitted small earnings of the school-children and wives.¹⁹

We have further assumed full-time work, except for builders,

¹⁸ We are informed that about 90 acres of land are at present available for allotments in the borough of Reading, and that there are about 825 tenants.

¹⁹ No doubt some of the class included own some property besides houses; there are 9,400 members of the Retail Co-operative Society in Reading. But it is unlikely that any perceptible amount is held by those below the standard.

while Mr. Rowntree made a study of annual earnings. The test is, therefore, more lenient than his, since overtime does not in general balance broken time and holidays.

Nevertheless, taking the York standard as explained, we find 128 households almost certainly below the standard, and 17 others probably below, out of 622. These 145 households contain 29 per cent. of the working-class population in our sample, and *we may affirm that, on the basis described, from 25 to 30 per cent. of the working-class population of Reading were in 1912, so far as they were dependent on their earnings, pensions or possessions, below Mr. Rowntree's standard, whereas in York, in 1900, only 15½ per cent. of the working-class population was below this standard.*²⁰

This is not the same thing as saying that 25 to 30 per cent. are near destitution, or even in poverty. In eight of the 145 cases poor-relief is known to be given, and it is probable in five others; in some cases it is known that absent relatives assist. There is a large number of charities and many charitable persons in Reading, and it is likely that clothes are often obtained. But it is not probable that gifts, doles and subsidies lift any large proportion of these families over the line; in general they only remove the destitution but leave a deficiency. In a register of the families who have obtained or applied for assistance from public or private sources in the twenty-six months beginning March, 1911, are 4,623 entries. In our sample we might expect about 220 of these.

The following table shows the constitution of the households below the York and the New standards. Out of 520 households headed by an adult male wage-earner, 111 (21 per cent.) are below one or both standards. Of 145 households where a sole male wage-earner has 2 or more children dependent, 79 (55 per cent.) are below. As the number of wage-earners increases, even if it is only a young lad or girl earning as well as the father, more younger children can be supported. Of 67 households where the father is ill, absent or deceased, 23 are below.

²⁰ Of the *whole* population I find 19 per cent. below the line; Mr. Rowntree found 10 per cent.

TABLE XI.—*Classification of households according to earners and the minimum standard.*

	Number of dependent children.	Number of households.	Below standard.	Probably below standard.	Possibly below standard.	Deficiency from new standard of those classed as below (nearest shilling). The letters f, m, &c., show dependents other than children.
1 man earning ...	0	65	2	—	—	2, 7 (m f)
	1	69	2	—	—	2, 2
	2	58	17*#	2	2	{ 1, 1, 1, 2, 2, 2, 2, 3, 3, 3, 4, 5, 5, 5, 5 (f), 6 (f)
	3	36	16	—	2	{ 1, 2, 2, 2, 2, 3, 3, 3, 4, 4, 5, 5, 5, 6, 11 (f), 12
	4	23	16*	1	1	{ 1, 2, 2, 2, 3, 3, 5, 6, 6, 7, 7, 7, 7, 8, 12
	5	12	8	2	—	3, 4, 5, 6, 7, 7, 8, 9
	6	9	6	2	—	5, 6, 6, 8, 11, 12
	7	6	3	3	—	8, 12, 18
	8	1	1	—	—	1
	?	11	1	3	—	
Totals		290	72	13	5	
1 man and 1 son or daughter earning	0	35	—	—	—	
	1	9	1†	—	—	1 (f)
	2	10	—	—	—	
	3	18	4*	—	—	4, 7 (f), 24
	4	5	5	—	—	2, 3, 4, 4, 6
	5	2	2	—	—	2, 3
	6	1	1	—	—	1
Totals		80	13	—	—	
1 man and 2 sons or daughters earning	0	20	—	—	—	
	1	12	—	—	—	
	2	9	—	—	—	
	3	6	1†	—	—	1
	4	6	2†	—	—	2, 3
	5	3	—	—	—	
	6	3	3	—	—	4, 16, 20
Totals		59	6	—	—	
1 man and 3 sons or daughters earning	0	6	—	—	—	
	1	5	—	—	—	
	2	3	—	—	—	
	3	2	—	—	—	
	4	1	—	—	—	
	5	2	—	—	—	
Totals		19	—	—	—	
1 man and 4 sons or daughters earning	0	1	—	—	—	{ Up to this point the wife is at home, and not earning, in every family below the standard except one (the second).
	2	2	—	—	—	
	4	1	—	—	—	
Totals		4	—	—	—	

TABLE XI *contd.*—*Classification of households.*

	Number of dependent children.	Number of households.	Below standard.	Probably below standard.	Possibly below standard.	Deficiency from new standard of those classed as below (nearest shilling). The letters f, m, &c., show dependents other than children.
Man and wife earning	0	7	—	—	—	11
	1	3	—	—	—	
	2	6	1	—	—	
	3	3	—	—	—	
	4	1	—	—	—	
Totals		20	1	—	—	
Man, wife, and 1 son or daughter earning	0	4	—	—	—	
	1	3	—	1	—	
	3	1	—	—	—	
	4	1	—	1	—	
Totals		9	—	2	—	
Man, wife, and 2, 3 or 4 sons and daughters earning	2	3	—	—	—	
	3	3	—	—	—	
	4	1	—	—	—	
Totals		7	—	—	—	
1 or more men and others working on their own account	0	5	—	—	1	{ 8 (m w s d working, b dependent). { 3 (m working, w, in, in, dependent). { 11 (m working, w and 7 children dependent).
	1	1	1	—	—	
	2	4	1	—	1	
	3	2	—	—	—	
	7	1	1	—	—	
Totals		13	3	—	2	
Miscellaneous groups of earners containing at least one man	0	10	—	—	—	{ 8 (m 1 f g working, m, f, sc, sc, dependent).
	1	2	—	—	—	
	2	5	1	—	—	
	3	1	—	—	—	
	4	1	—	—	—	
Totals		19	1	—	—	
1 woman earning	0	24	6	—	3	{ 2, 2, 4, no dependents, and 4, 5, ‡ 10, ‡ m dependent. 4, 5 16‡ (m dependent). 18 (m dependent).
	1	3	2	—	—	
	4	1	1	—	—	
	5	1	1	—	—	
Totals		26	10	—	3	

TABLE XI *contd.*—Classification of households.

	Number of dependent children.	Number of households.	Below standard.	Probably below standard.	Possibly below standard.	Deficiency from new standard of those classed as below (nearest shilling). The letters f, m, &c., show dependents other than children.
1 woman and 1 son or daughter earning	0 1 3 4	6 3 1 1	1 1 1 1	— — — —	1 — — —	{ 4 (w b working, no dependents). 9 (w b working). 17 † (w b working). 15 (w b working, m dependent).
Totals		11	4	—	1	
1 woman and 2 or more sons and daughters earning	0 1 2 3	8 2 1 1	3† — 1 1	— — — —	— — — —	{ 2 (w s d working, m dependent); 4 (w b b working, no dependents); 3 (w d g working, no dependents). { (7 w d b working, m dependent). 5 (w d d b working).
Totals		12	5	—	—	
Sons and daughters only earning	0 1 2 5	9 6 2 1	— 1 2 1	— — — —	— — — —	{ 9 (d working, f dependent). 10 † (d d g working, f dependent); 10 (s d g working, f dependent). 12 (s s b b working, m f dependent).
Totals		18	4	—	—	
No apparent earnings	0 1 2 4	2 1 1 3	2 1 — 1	— — 1 1	— — — 1	3 (f), 6 † (f) 10 (f) 18 (f)
Totals		7	4	2	1	
Past work	0 1	26 2	8* 1	— —	5 —	{ 1 (m f), 1 (m f), 10 † (m f), 2 (f), 4 (f), 11 † (f), 2 (f) 4 (m f)
Totals		28	9	—	5	
Grand totals		622	—	17	17	
By Mr. Rowntree's standard		—	128	—	—	
By new standard ...		—	127	—	—	

* In 5 cases in the aggregate of the groups thus marked earnings are above the new standard, but below Mr. Rowntree's.

† In 4 cases in the aggregate of the groups thus marked earnings are below the new standard, but above Mr. Rowntree's.

‡ Poor relief stated in these cases.

Of the 95 working-class lodgers, it is estimated that 24 (4 m, 9 f, 5 sc, and 3 in) live below the new standard. Including these, but omitting 9 households as to whose constitution information is wanting, we obtain the following table :—

	Earning.					
	Men.	Women.	Girls.	Lads.	Boys.	Total.
Below New } standard }	112	33	9	9	16	178
Total	729	227	35	55	43	1,089
Percentage below	15½	14½	26	16	37	16

	Dependent.						
	Men.	Women.	Girls.	Boys.	School children.	Infants.	Total.
Below standard ...	24	134	3	4	292	151	608
Total	50	564	9	9	623	334	1,600
Percentage below	48	24	33	44	47	45	38

	Earning and dependent.				All.
	Men.	Women.	Girls, lads and boys over 14.	Children and infants under 14.	
Percentage below	18	21	27	46	29

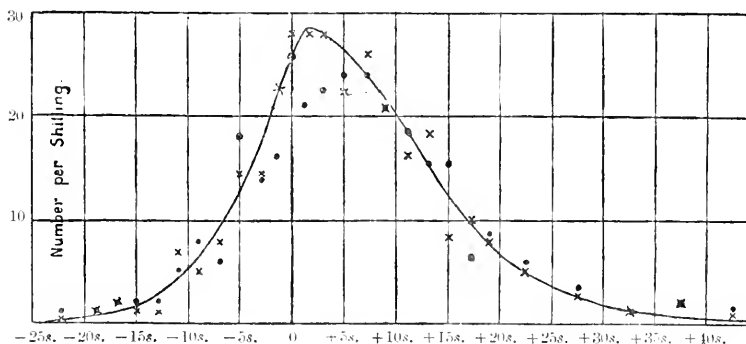
Persons below, 786; persons above, 1,904; total, 2,690.

Table XII and the diagram show by how much the households fell short. One hundred and eleven of the 145 failed by more than 2s., and 66 by more than 5s. Perhaps the 2s. might be made up in good times; but it is not possible to reduce the total number actually short of adequate food and clothing much on any hypothesis, for we have assumed that all earnings are economically spent and that employment is perfect. Actually, 19²¹ households more would have been counted below the line if we had taken the amount of employment in the week previous to the visit in each case as typical, instead of assuming full employment, and the autumn of 1912 was a specially busy time.

²¹ In 6 other households the distance below the line would have been increased, and 15 more would have a smaller excess, if the earnings of the particular week had been taken.

TABLE XII.

Relation to Mr. Rowntree's standard.				Relation to new standard.			
Above.	Number of households.	Below.	Number of households.	Above.	Number of households.	Below.	Number of households.
<i>s.</i>		<i>s.</i>		<i>s.</i>		<i>s.</i>	
+40	7	-22	2	+40	4	-24	1
+35 to 40	11	-21 to 22	1	+35 to 40	11	-20 to 24	1
+30 „ 35	6	-20 „ 21	1	+30 „ 35	6	-18 „ 19	2
+25 „ 30	17	-19 „ 20	1	+25 „ 30	13	-17 „ 18	1
+20 „ 25	30	-18 „ 19	1	+20 „ 25	26	-16 „ 17	3
+18 „ 20	17	-17 „ 18	2	+18 „ 20	16	-15 „ 16	2
+16 „ 18	13	-16 „ 17	2	+16 „ 18	20	-14 „ 15	1
+14 „ 16	31	-15 „ 16	1	+14 „ 16	17	-12 „ 13	2
+12 „ 14	31	-14 „ 15	3	+12 „ 14	37	-11 „ 12	4
+10 „ 12	37	-13 „ 14	1	+10 „ 12	33	-10 „ 11	10
+8 „ 10	42	-12 „ 13	3	+8 „ 10	42	-9 „ 10	4
+7 „ 8	20	-11 „ 12	4	+7 „ 8	23	-8 „ 9	6
+6 „ 7	28	-10 „ 11	6	+6 „ 7	29	-7 „ 8	10
+5 „ 6	26	-9 „ 10	8	+5 „ 6	27	-6 „ 7	6
+4 „ 5	22	-8 „ 9	8	+4 „ 5	19	-5 „ 6	13
+3 „ 4	18	-7 „ 8	7	+3 „ 4	24	-4 „ 5	16
+2 „ 3	27	-6 „ 7	5	+2 „ 3	31	-3 „ 4	16
+1 „ 2	21	-5 „ 6	13	+1 „ 2	28	-2 „ 3	13
+0 „ 1	48	-4 „ 5	23	+0 „ 1	50	-1 „ 2	22
Amount not known	} 24	-3 „ 4	15	Amount not known	} 21	-0 „ 1	6
		-2 „ 3	13			Amount not known	} 6
		-1 „ 2	16				
		-0 „ 1	4				
		Amount not known	} 6				
	476		146		477		145



Number of households whose known incomes are at various distances above or below Mr. Rowntree's standard (•••), and the new standard (×××).

The continuous line is drawn freehand in relation to the new standard.

About 45 per cent. of the children under 5 years in working-class houses, and 47 per cent. of the school children in the public elementary schools²² appear to have been living in households below the standard at the time of the inquiry. The actual proportion of children who at some period before they are 14 years old are in such households must be much higher than this; for of the other children enumerated in Table VII, some have recently passed above the line owing to their elder sisters or brothers getting to work, and some will fall below the line owing to the arrival of competitors for food as yet unborn. The wage statistics that follow, read in conjunction with the standard table, support the view that *more than half the working-class children of Reading, during some part of their first fourteen years, live in households where the standard of life in question is not attained.*

Rates of wages.

The following rates of wages are, as explained above, derived from statements made by the wage-earners or their wives, criticised and adjusted in the light of general information, but not checked by reference to the employers.

TABLE XIII.

Normal weekly wage rate.	Married householders.			Other men over 20 years where known.	All.
	Stated.	Estimated.	Together.		
Number	296	178	474	54	528
Under 18s.	6	8	14	23	37
18s. to 19s.	16	12	28	5	33
19s. „ 20s.	8	3	11	1	12
20s. „ 21s.	51	17	68	7	75
21s. „ 22s.	39	14	53	3	56
22s. „ 23s.	24	9	33	1	34
23s. „ 24s.	14	5	19	2	21
24s. „ 25s.	22	10	32	3	35
25s. „ 26s.	28	25	53	2	55
26s. „ 27s.	5	1	6	3	9
27s. „ 28s.	12	5	17	1	18
28s. „ 29s.	6	1	7	—	7
29s. „ 30s.	6	0	6	—	6
30s. „ 31s.	23	34	57	1	58
31s. „ 35s.	15	5	20	1	21
35s. „ 40s.	14	15	29	1	30
40s. and over	7	14	21	—	21
Approx. Average	24s. 6d.	26s.	25s.	20s.	24s. 6d.

²² In 1912, 1,407 children from 512 houses were given free meals at one time or another by the Education Committee. This number is larger than usual, owing to an excess during the coal strike. In January, 1912, the number was 851, besides 71 in Whitley Special School.

The higher average for householders whose wages were estimated is due to the fact that the better off people were, the less willing did they prove to give information.

It appears that the average wage for a full week's work for men over 20 years of age in Reading is about 25s. A similar average for York, in 1899, was 26s. 6d.²³ Since then wages in general have risen about 10 per cent., but Reading remains 2s. below where York was. The general average for men in industrial occupations in 1906 in the United Kingdom was about 29s.,²⁴ and by this time must be 30s. It thus appears that the average in Reading is relatively very low. This is, of course, connected with the absence of any industries employing a large proportion of skilled men, with the close connection between Reading and the surrounding agricultural districts.

The immediate causes of deficiency of income in Reading can be compared with Mr. Rowntree's table, edition 1908, p. 120, for York.

TABLE XIV.

Immediate cause.	Percentage of households below the standard.	
	York.	Reading.
Death of chief wage-earner	27	14
Illness or old age of chief wage-earner	10	11
Chief wage-earner out of work	3	2
Irregularity of work.....	3	4
Largeness of family, <i>i.e.</i> , more than four } children	13	20
In regular work, but at low wages	44	49
	100	100

In York the first two classes, where there is no man earning, account for 3·3 per cent. of the households of the city; in Reading, about 4 per cent. The main reason for the greater poverty of Reading is therefore due to relative lowness of wages; or, to put the same thing in other words, the wages of unskilled labour are not sufficient in Reading, and were not in York, to support a family of three or more children.

It would be quite wrong to assume that the towns of the United Kingdom as a whole would show so large a proportion below the standard as Reading. We can make from official statistics a very rough and preliminary calculation as to this. It appears from calculations that I have based on the Wage Census of 1906, allowing for the change of prices and wages since then, that 23 or 24 per cent. of workmen in towns and industrial districts and occupations²⁵

²³ *Journal of the Royal Statistical Society*, 1902, p. 359. Men over 18: if over 20 had been taken, it might be nearer 27s.

²⁴ Wage Census of 1906 *passim*.

²⁵ We have no adequate information as to coal-mining, but it would not affect greatly this number.

have weekly wages below the standard for the support of a wife and three children. From p. 682 it appears that between $\frac{1}{7}$ and $\frac{1}{5}$ of these have such a family to support, so that only about 4 per cent. of men in industry are below the standard for this cause; about 1 per cent. more fail for lack of means to support 2 children. That is, about 5 per cent. of the men regularly engaged in industry in the United Kingdom have a family for which their earnings are not sufficient, whereas for Reading we should have to write 13 per cent. in this phrase; for York it would be, I think, 6 or 7. Assuming about the same amount of poverty, due to other causes, as in Reading or York, we shall find, I think, somewhat over 13 per cent. of the *industrial* working-class population of Great Britain below the standard at any one time,²⁶ as compared with 15½ per cent. in York and 25 to 30 per cent. in Reading. But a very much larger proportion of families pass below the standard at one time or another, and it is evident that the proportion of children affected is much greater than the proportion of adults. It is hoped that this calculation may be put on a firmer basis when more towns have been investigated and when the current population census is completed.

The calculation affords no clue to the condition of the *agricultural* population.

Note as to wages of lads and girls.

From our cards it appears that a girl of 14 or 15 would get about 5s. 6d. at a factory or printing, whereas if she went into daily service she would get 2s. to 3s. and food. If she was apprenticed to a dressmaker she would probably get 1s. or 2s. At the age of 17 she would be getting about 7s. at a factory, and about 4s. 6d. at a dressmaker, 7s. at a tailor, and about 5s. 6d. at a laundry. She would probably be earning 8s. 6d. at a factory when she was 19, and later about 11s.

A boy of 14 or 15 would get about 6s. 6d. at a factory or workshop, and about 5s. as an office boy, clerk or errand boy. At 17 and 18, in a factory, he would be getting 8s. or 9s., whereas as a shop assistant it would be rather less than 9s. At 18 and 19, at a factory and in most trades, he would get about 10s. or 11s., though as a clerk he would be earning 12s. or 13s., or more. At the age of 22 he would probably be getting 1l. a week in unskilled work.

Expenditure.

No large collection of budgets has been attempted. Five budgets are summarized on pp. 700—1; of these B, C, D and E are from careful documented accounts extending over several weeks, while A depends on one week only. They have been tabulated in such a form as to be at once comparable with the New standard, for which rent has been assumed to be 1s. 3d. per equivalent adult, with a minimum of 4s. In all but E earnings are above the minimum, but in each case the

²⁶ Besides those whose members are unemployed and those who fail to spend judiciously when near the line.

expenditure on food (even allowing for allotment produce) is slightly below it, while that on rent and on sundries is above it. In E there is a great deficiency of food expenditure, nevertheless sundries (in this case including 1s. 10d. insurance, and 1s. father's pocket money) are high; the weekly 7s. 3½d. on food is divided thus: butcher, 1s.; baker, 3s.; milk, 6d.; vegetables, 6d.; groceries, 2s. 3½d. In A, B, C, D the butcher receives 2s., 2s. 2d., 1s. 9d. and 3s. 6d. respectively. It appears, then, that other wants are found more pressing than sufficiency of food, and that the New standard, allowing for expenditure on meat, fits the facts.

Note.—A small sum of money was subscribed for the purpose of making the inquiry in Reading; the collection of data was superintended by Miss S. Honey. The tabulation was carried out at the London School of Economics with the help of Mr. A. R. Burnett-Hurst.

ADDENDUM.

Classification of 622 households according to the wage-earners and dependents they contain.

Wage-earners.	Number of households.	Dependents.
Man only	65	{ No children, viz., w, 45; w, f, 8; w, d, 1; f, 4; d, 2; f, f, 1; m, f, 4.
	69	{ 1 child, viz., w, in, 33; w, se, 29; w, f, in, 4; w, f, se, 2; w, m, in, 1.
	58	{ 2 children, viz., w, g, se, 1; w, in, in, 16; w, se, in, 27; w, se, se, 8; w, g, in, 1; w, b, se, 1; w, f, se, in, 2; se, se, 1; f, se, se, 1.
	36	{ 3 children, viz., w, in, in, in, 1; w, se, in, in, 9; w, se, se, in, 19; w, se, se, se, 3; w, g, se, in, 1; w, f, se, se, in, 1; w, f, b, se, in, 1; w, f, se, se, se, 1.
	23	{ 4 children, viz., w, se, in, in, in, 4; w, se, se, in, in, 8; w, se, se, se, in, 10; w, se, se, se, se, 1.
	12	{ 5 children, viz., w, se, se, in, in, in, 1; w, se, se, se, in, in, 3; w, se, se, se, se, in, 5; w, g, se, se, in, in, 1; w, b, se, se, in, in, 1; w, b, se, se, se, in, 1.
	9	{ 6 children, viz., w, se, se, se, in, in, in, 3; w, se, se, se, se, in, in, 2; w, se, se, se, se, se, in, 3; w, f, se, se, se, se, in, in, 1.
	6	{ 7 children, viz., w, se, se, se, se, in, in, in, 1; w, se, se, se, se, se, in, in, 2; w, se, se, se, se, se, se, in, 1; w, g, se, se, se, se, in, in, 1; w, b, se, se, se, se, se, in, 1.
	1	8 children, viz., w, se, se, se, se, se, se, se, se.
	11	Information lacking.
Total	290	
Man and girl	8	{ w, 1; w, se, 2; w, se, se, se, 1; w, se, se, se, in, 3; w, d, se, se, se, 1.
Man and boy	15	{ w, 3; w, se, 1; w, se, in, 2; w, se, se, 3; w, se, se, se, 1; w, se, se, in, in, 1; w, se, se, se, in, in, 1; w, se, se, se, se, in, in, 1; d, se, se, 1; w, f, se, 1.
Man and lad	10	{ w, 1; w, se, 1; w, se, se, in, 4; w, g, se, se, 1; w, se, se, se, se, 1; se, 1; f, 1.
Man and daughter.....	20	{ None, 2; w, 10; w, se, in, in, 1; w, se, se, in, 1; w, se, se, se, 1; w, se, se, in, in, in, 1; w, f, se, in, in, 1; w, f, 1; w, b, se, 1; d, 1.
Man and son	27	{ w, 11; w, se, 2; w, se, se, 2; w, se, se, in, 2; w, se, se, se, 2; w, b, se, 1; w, w, in, in, in, 1; w, w, se, se, in, 1; w, m, se, in, 1; w, f, 3; w, m, 1.
Man, boy and girl	1	w, se, se.
Man, lad and girl	3	w, se, 1; w, se, se, se, 1; w, se, se, se, in, 1.
Man, lad and boy	1	w, se, se, in.
Man, daughter and girl	4	w, 2; w, se, 1; w, f, se, se, 1.
Man, daughter and boy	2	w, se, se, se, in, 1; w, se, se, se, se, in, in, 1.

Classification of 622 households—contd.

Wage-earners.	Number of households.	Dependents.
Man, daughter and lad	8	{ None, 1; w, se, 1; w, se, se, 1; w, se, se, se, 1; w, se, se, in, in, 1; w, se, se, se, in, in, 1; w, se, se, se, in, in, 1; w, se, se, se, in, in, 1.
Man, son and girl	4	{ w, se, 1; w, g, se, 1; w, h, se, se, 1; w, se, se, in, 1.
Man, son and boy	5	{ w, 1; w, se, se, 2; w, se, se, se, se, 1; w, se, se, se, in, in, 1.
Man, son and lad	7	{ w, 1; w, in, 2; w, se, 2; w, se, se, 2.
Man, and 2 daughters	6	{ w, 6.
Man, son and daughter	11	{ w, 3; w, se, 4; w, se, se, se, in, 1; w, se, se, se, in, in, 1; w, m, 2.
Man and 2 sons	7	{ w, 2; w, d, 1; w, se, in, 1; w, se, se, in, 1; d, 1; m, se, se, se, se, in, 1.
Man, daughter, lad } and girl	1	{ w, se.
Man, daughter, lad } and boy	1	{ w, se.
Man, son, lad and boy	1	{ w, f, se.
Man, 2 daughters } and girl	1	{ w, se, se, se, se, in.
Man, 2 daughters } and boy	1	{ w, se, se.
Man, son, daughter } and girl	1	{ w.
Man, son, daughter } and lad	3	{ w, se; w, se, se; w, se, se, in.
Man, 2 sons and girl ...	1	{ w, se, se, in.
Man, 2 sons and lad	2	{ w, f; w, se, se, se, se, se.
Man and 3 daughters ...	2	{ w; w, se.
Man, son, and two } daughters	2	{ w; w, se, se, se.
Man, 2 sons and } daughter	2	{ w; w, se, se.
Man and 3 sons	1	{ f.
Man, 3 daughters and } girl	1	{ w, se, se, se, in.
Man, son, 2 daughters } and lad	1	{ w.
Man, 3 sons and } daughter	1	{ w, se, in.
Man, son, 3 daughters } and lad	1	{ w, se, se.
162		
Man and wife*	20	{ None, 7; se, 3; in, in, 1; se, se, 3; h, se, 1; se, se, in, 1; se, se, se, 2; se, se, se, in, 1; w, in, in, f, 1.
Man, wife and boy	2	{ None; se, se, se, se.
Man, wife and lad	3	{ None, 1; se, 2.
Man, wife and daughter	3	{ None, 1; se, 1; se, se, se, 1.
Man, wife and son	1	{ None.

* f not w in one case.

Classification of 622 households—contd.

Wage-earners.	Number of households.	Dependents.
Man, wife, lad and girl	1	se, se, se.
Man, wife,* daughter and girl	2	f, se, se, in, in; se, se, se.
Man, wife, daughter and boy	1	se, se.
Man, wife, son and daughter	1	m, d, in, in.
Man, wife, son, daughter and boy	1	se, in, in.
Man, wife, son, 2 daughters and girl	1	se, se.
36		
One man	8	{ None, 1; w, 1; w, in, in, 3; w, se, se, in, 2; w, se, se, se, se, in, in, in, 1.
Two men	2	f, 2.
Man and boy	1	w, se, se.
Man, wife, son and daughter	1	b.
Man, daughter, 2 sons and boy	1	w.
Two men	12	{ w, 3; w, in, in, 1; w, se, se, 1; w, se, se, in, 1; w, m, 1; w, m, se, 1; w, w, se, se, se, se, 1; m, f, 1; f, 1.
Three men	1	f, f, se, in.
Four men	2	w; f, f, g.
Man and woman	2	m, 2.
Man and 3 women	1	w, se, in.
Man, woman, lad and girl	1	w, f, se, se.
32		
One woman	22	{ None, 8; se, 3; f, 3; m, 4; m, f, 1; m, se, se, se, se, 1; m, se, se, se, in, in, 1; ?, 1.
Two women	4	None, 3; m, f, 1.
Woman and boy	4	None, 2; f, se, se, in, 1; ?, 1.
Woman and lad	1	None.
Woman and daughter	2	None; se.
Woman and son	4	None; in; f; m.
Woman and 2 boys	1	None.
Woman and 2 lads	1	None.
Woman, daughter and boy	1	m, g, se.
Woman, daughter and girl	1	None.
Woman, son and girl	1	None.
Woman and 2 daughters	1	None.
Woman, son and daughter	2	None; m.
Woman and 2 sons	1	se.

* f not w in one case.

Classification of 622 households—contd.

Wage-earners.	Number of households.	Dependents.
Woman, 2 daughters and boy	1	sc, sc, sc.
Woman, son, daughter and girl	1	sc.
Woman, 3 sons and lad	1	None.
	49	
Daughter.....	3	f; f, in; f, sc.
Son and daughter	3	f; m, f; b, f.
Two sons	1	f.
Two daughters and boy	1	f.
Two daughters and girl	1	f, sc, sc.
Son, daughter and girl	1	f, sc, sc.
Son and 2 daughters	1	f.
Two sons and daughter	2	f; f.
Three sons	1	f.
Two sons and lad	1	f, sc.
Two sons, lad and boy	1	f, sc.
Two sons and 2 lads	1	m, f, sc, sc, sc, sc, sc.
Four sons	1	f, sc.
	18	
No earners	35	{ f, 11; f, f, 1; m, 3; m, f, 13; f, sc, 2; m, f, sc, 1; f, in, in, 1; f, sc, sc, in, in, 1; f, sc, sc, sc, in, 2.
	622	

Five budgets.

	A		B	
	Actual expenditure.	New standard.	Actual expenditure.	New standard.
	s. d.	s. d.	s. d.	s. d.
Rent	6 0	4 0	6 0	4 6*
Clothes	1 0	1 10	2 2½	1 5
Fuel and State Insurance	2 10†	1 10	1 6	1 10
Food	9 4	11 2	13 2	14 2*
Other expenditure	2 8	0 8	5 1½	0 8
Total	21 10	19 6	28 0	22 7
Earnings†	22 0	—	30 6	—

Five budgets—contd.

	C		D		E	
	Actual expenditure.		Actual expenditure.		Actual expenditure.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Rent	5 6	4 0	7 9	6 3*	4 6	4 3
Clothes	2 2½	1 10	2 0	3 1	1 6	2 8
Fuel and State Insurance }	1 7	1 10	2 4	1 10	1 10	1 10
Food	10 1	11 11	21 9	22 5*	7 3½	14 11
Other expenditure	2 7½	0 8	13 2	1 4	3 10½	1 0
Total	22 0	20 3	47 0	34 11	19 0	24 8
Earnings†	22 0	—	47 0	—	19 0	—

A consists of husband aged 28, wife aged 28, child aged 2 and infant 4 months. Total earnings 22s. Also garden and allotment, whose produce brings the food nearly up to standard.

B consists of husband (occupation, tin tester), wife and a girl of 7 months. Total earnings 20s. 6d. 1 lodger pays 10s. 5-roomed house.

C consists of husband (occupation, corndealer's storeman), wife and 2 boys of 8 years and 4 years. Total earnings 22s. 5-roomed house with an allotment garden of 30 poles; garden is rented at 5s. a quarter. Its produce brings the food nearly up to standard.

D consists of husband (occupation, toolmaker), wife, 3 girls (11, 9 and 6 years) and 2 boys (4 years and 1 year 8 months). Total earnings 35s. 1 lodger pays 12s. 6-roomed house.

E consists of husband (occupation, carter), wife, 3 boys (8, 4 and 1½ years) and a girl of 2½ years. Total earnings 19s. 4-roomed house (2 sitting-rooms, and 2 bedrooms).

* Lodger is here included as part of the family as his 10s. goes towards rent and food expenditure.

† Includes gas.

‡ Including the whole of lodger's payments.

AN EXPERIMENTAL TEST OF THE NORMAL LAW OF ERROR.

By J. W. NIXON, B.Sc.

THERE have been many attempts to show how results obtained at random conform to the normal law of error. There is Professor Pearson's analysis of the Monte Carlo Roulette figures (*Chances of Death*, vol. 1, p. 42), the late Professor Weldon's results of dice-throwing (cited by Professor Edgeworth in "Law of Error" (*Ency. Brit.*, 10th edition, p. 280), and various results in Westergaard's *Grundzüge*. The following figures are an attempt to show how aggregates of quantities which conform to scientific law may yet exhibit signs of fortuitousness as tested by the normal curve of error. Chambers's logarithm tables were selected for the purpose, and the digits used were those forming the seventh place of decimals of the 10,000 logarithms, from 801 to 10,800. These were summed successively in batches of 25; from each sum was subtracted 112.5 (25×4.5), and each difference so obtained was divided by 5, (the square root of 25). This experiment, it will be noticed, is identical with that given (for 1,200 logs.) by Professor Edgeworth in his Presidential Address (*Journal*, January, 1913, p. 189). The figures so obtained should conform approximately to a normal curve of centre zero and standard deviation $\sqrt{8.25}$. The figures are grouped and compared with the normal curve in Table I.

TABLE I.

Deviations.		In groups of 25.		In groups of 100.		
		Observed.	Calculated.	Observed.	Calculated.	(Difference) ² Calculated
Negative	8-7 ...	1	1.32	0	} 1	0
	7-6 ...	2	2.76	1		
	6-5 ...	10	6.56	1		.50
	5-4 ...	13	13.80	1	3	1.33
	4-3 ...	17	24.76	9	6	1.50
	3-2 ...	39	38.70	9	10	.10
	2-1 ...	58	52.00	10	13	.69
	1-0 ...	62	60.10	13	15	.266
Positive	0-1 ...	57	60.10	11	15	1.066
	1-2 ...	48	52.00	16	13	.69
	2-3 ...	36	38.70	9	10	.10
	3-4 ...	15	24.76	9	6	1.50
	4-5 ...	10	13.80	5	3	1.33
	5-6 ...	12	6.56	5	2	4.50
	6-7 ...	5	2.76	0	1	0
	7-8 ...	9	} 1.32 {	0	}	$\chi^2 = 13.572$
	8-9 ...	5		0		
	9- ...	1		1		
		400	400	100	100	P = .40

The same figures were then summed in batches of 100; the deviations from 450 were divided by $\sqrt{100}$ and compared with a normal curve of the same standard deviation as the former case. For these figures the criterion P (Pearson, *Phil. Mag.*, July, 1900) was evaluated. The results are shown in Table I.

Hence the chance is about 3 to 2 against a random sample leading to a system of deviations as great as that shown by the data.

It was noticed, however, while extracting the figures that they were not entirely independent. Many "runs" of figures were noticed, *e.g.* :

In the seventh decimal place of logs. 5494—5500 there is a run of 7 sevens.

"	"	7752—7759	"	8 eights.
"	"	5711—5718	"	8 twos.
"	"	8681—8690	"	10 eights.
"	"	8858—8869	"	12 sevens.

These sequences were due to the fact that the second differences of successive logarithms were so small as to render the first differences (up to the seventh decimal place) constant, and only after a succession of logarithms did these differences accumulate sufficiently to assert themselves in the seventh place. It is interesting at this point to note that in the *sixth* decimal place of logs., 8,669 to 8,703, there is a run of 35 nines! A similar reason accounts for runs of quantities in pairs, where 5 is the common difference, such as:—

7.2, 7.2, 7.2 . . .
8.3, 8.3, 8.3 . . .
0.5, 0.5, 0.5 . . .

To test the result when this cause was removed, a hundred totals (of 100 each) were obtained by summing the last digits of the logarithms of—

801, 901, 1001 . . . 10,701

802, 902, 1002 . . . 10,702

instead of 801, 802, 803 . . . 900

This was carried out by arranging the whole of the 10,000 figures in a square (100×100) of which the rows when summed would give the figures above quoted and the columns gave the totals now sought. A quarter of this square is printed as a specimen in Table II. The results were as follow:—

TABLE III.

Negative deviations.							
	Over 6.	6—5.	5—4.	4—3.	3—2.	2—1.	1—0.
Observed	2	3	2	5	11	8	14
Theory	1	2	3	6	10	13	15
Difference ²	1	5	33	16	1	1.92	.066
Theory							

TABLE III—*Contd.*

	Positive deviations.						
	0—1.	1—2.	2—3.	3—4.	4—5.	5—6.	Over 6.
Observed	11	10	10	10	7	3	4
Theory	15	13	10	6	3	2	1
$\frac{\text{Difference}^2}{\text{Theory}}$	1.06	.69	0	2.66	5.33	.5	.9

Whence $\chi^2 = 23.32$, $P = .036$ (about).

and the chance is thus about 26 to 1 against such a grouping being a random sample from a purely normal distribution. The unsatisfactory nature of this result is almost entirely due to the last batch of twenty-five deviations of which twenty-two were positive. The first fifty show a much closer correspondence with theory, as shown by the following tables (IV and V). As only fifty totals were used, the figures were not grouped in units of deviation, but according as they were between the upper and lower quartile, the quartile and the decile, &c. The quartile in the normal curve is at 1.9, the decile at 3.7.

TABLE IV.

	Between 0 and ± 1.9 .	Between ± 1.9 and ± 3.7 .	Above ± 3.7 .
Observed	22	14	14
Calculated	25	15	10
$\frac{(\text{Difference})^2}{\text{Calculated}}$ .....	.36	.06	1.6

Whence $\chi^2 = 2.02$, $P = .36$.

TABLE V.

	Below the lower quartile.	Between the median and the lower quartile.	Between the median and the upper quartile.	Above the upper quartile.
Observed	14	16	16	14
Calculated	12.5	12.5	12.5	12.5
$\frac{(\text{Difference})^2}{\text{Calculated}}$ .....	.18	.98	3.38	.18

$\chi^2 = 4.72$, P about .2.

As a last test, the figures contained in the *first quarter* of the square above referred to were summed diagonally, *i.e.*, the central diagonal of 50 digits was summed, the adjoining diagonal of 49 digits was summed, together with 1 digit in the opposite corner, the next diagonal of 48, together with the 2 digits adjoining the corner digit, and so on. The 50 totals, each of a batch of 50, were grouped as in Tables IV and V. It will be seen that P is approximately of the same order.

	Between 0 and ± 1.9 .	Between ± 1.9 and ± 3.7 .	Above ± 3.7 .
Observed.....	20	16	14
Calculated	25	15	10

$$\chi^2 = 2.22, P = .33.$$

	Below the lower quartile.	Between the median and the lower quartile.	Between the median and the upper quartile.	Above the upper quartile.
Observed.....	18	9	11	12
Calculated	12.5	12.5	12.5	12.5

$$\chi^2 = 3.58, P = .33.$$

The whole of the original tabulation of the figures which are summarised in this paper have been deposited with the Society. It only remains for me to thank Professor Edgeworth (at whose suggestion this experiment was undertaken) for the help and criticism he has afforded.

TABLE II.—*Extract from a larger table of 10,000 digits forming the seventh place of decimals of logs 801–10,800.*

54509054509054621399288290535103015350030164744979
85846238944882153758697077079796968686969708103260
1797105524254007082279609441427735388453773537353
36513168501822922810698354919464919353796120564908
56503393416873663787254105649117120576378614405664
43046526763787489848985895910612183541688503316998
10713317010724439243169095022060229489850332835640
79085033295899626886279085045428244293676493553047
36664059110848133294943315641602218379086268986279
35540590095045540580085048370119615788628245429480
78752724665283689974947898527135531725788639479097
15890974947909851602443173702331950468875283680086
11974947911085159234329504700097494802220749368009
17371456652950479009740593567642949257887528370345
03566531737146787530615802221962725801109639381355
63959368909864060470122107405935799875294936801109
20851615802333197394814678875306160357888752950481
7383713577765306272581344321851726025677541849482
43207406159246777653073837146789986418494825789009
63073837035788886529516159145677653184060581357777
11109741738371478011109752849492681234432196395049
74061604702455654319628493714680111198630738371580
07395048258012333219751849493692467888764206395048
8887653074061614814689000976318405159369245677776
73950504703579001009753074050504703578900098753074
5160582580234555543196306283826036802345543197418
63961616047035790111109864185173837259247901233321
11110986418518394837046913567777654318639627272604
17383715925701345666543208630628494937147924578899
14702467890099876429740739494826036913567888887643
91357899009987542974073940594825814680123444332197
03680246788888876431863073950605947147024689011111
61615937147924578901110098653085295273949371592580
87542974185173849382603702579123455555432197530741
70470357912245566665542197520740739405049370470357
44332097530851840627382715936924791345778888876543
40739516161593714703579134567788776543108631851840
05948269258136891234566665543219753085295173940594
26036925791356789900099876531975307417406172727150
3603692579134678990009987653197530741730517272726
7260481581469135689012333332109865319641851840627
73950516059482592581468024678901112211099765319752
97531863074173951727272615936036925702457801223344
35677899999887654310864196307406394061616150482592
9383726047147036813579023456677777665432097531863
87654219753186307306395062727271604826966924702468
26037047035803578023456778888888765432197531964185
66543219864208530741740739506172726150482592692570
6161616049370481470368135791245688900111110998764
02456890012222222210997653208642974185295284062838

OBITUARY.

Alfred de Foville.

THE Royal Statistical Society will join with no uncertain note the chorus of lament which the statisticians of the world raise to-day on the loss which our science has sustained by the death of our distinguished colleague, Alfred de Foville, whose name has been for many years to English workers one of the best known on the roll of our Honorary Fellowship. Dying but a few months after completing his threescore years and ten, M. de Foville has left behind him a unique record of admirable labour, and a reputation for brilliant and effective exposition of economic and statistical problems. His career has been one which not only achieved for him the highest personal distinctions, but won for him at the same time the love and affection of all his friends and comrades in many lands. For his own country, France, for the International Statistical Institute, of which he was always a prominent and honoured leader, and for our own Society, whose *Journal* had so often placed before English readers typical illustrations of his work, the termination of so valuable a life is a veritable disaster.

Born at the close of 1842, M. de Foville entered early on official work as auditor in the *Conseil d'Etat* in 1866, and became in 1871 *Sous-chef du Cabinet* in the Ministry of Finance—a department in which he won distinction. In 1877, when presiding over the Bureau de Statistique et de Législation comparée, he founded the *Bulletin* of that office, a monthly publication, the merits of which are widely recognised. In 1893 he became Director of the *Administration des monnaies et médailles*, and in that high function, in charge of the Mint of France, he displayed remarkable ability, finding scope also for the exercise of his artistic leanings in the development of the *Musée des Monnaies*, while his illuminating reports on the production and consumption of the precious metals and monetary circulation remain monumental documents. In 1900 M. de Foville became *Conseiller maître à la Cour des Comptes* and *Conseiller maître honoraire* towards the close of his career.

Side by side with his administrative duties, M. de Foville gave valuable service to economic and statistical science, both in professorial appointments and in numerous publications. As early as 1873, his *Essai sur variations des prix au XIX^e siècle* received the recognition of the Institute. Seven years later his volume on *La transformation des moyens de Transport et ses conséquences économiques et sociales* remains well worthy of reference in an age when the full effects of development of means of locomotion has not always been justly appreciated. Students of land problems will turn to

M. de Foville's book entitled *Le Morcellement*, published in 1885, as a veritable text-book for the perpetual controversy on small and large holdings. His compendious work, *La France économique, statistique, raisonnée et comparative*, finds a necessary place in every statistical library, and it may be regretted that his growing occupations and diminished leisure denied him the realisation of his intention to bring the volume of 1889 up to date by a later edition. One may also mention his *Enquête sur les conditions des Habitations en France*, 1894-99. Among later works were his brochure on *La Richesse en France*, 1906, and *La Monnaie*, 1907. It would, however, be impossible to complete the roll of his literary labours within the compass of a notice such as this, for many of his most striking criticisms and comments on statistical questions were given in isolated addresses, essays, and contributions to various societies and journals. These all sparkled with the wit, the wisdom, the penetrating exposition of common forms of error, and not infrequently with the gentle, but telling irony, which charmed his hearers, and marked out the character of the man as pre-eminent in amiability and yet acute in detection of imposture.

To recount the part which M. de Foville played in the business of the International Statistical Institute would be to rewrite the series of its Bulletins; for, from its foundation in London in 1885 to its latest session in 1911 at the Hague, when he succeeded his lamented French colleague, Levasseur, in the Vice-chair of the Institute, no more active worker, no more wise adviser, no more brilliant orator has been found in its ranks. His loss will perhaps be nowhere more lamented than among his many personal friends who have worked with him in the sessions of the Institute.

Needless, with such a record, is it to repeat the roll of his posts and honours. From 1878 he was professor at the *École libre des Sciences politiques*; from 1882, professor of political economy and statistics at the *Conservatoire des Arts et Métiers*. The Academy of Moral and Political Sciences, of which he had been a member from 1896, raised M. de Foville, in 1909, to the high and merited distinction of Perpetual Secretary. A Commander of the Legion of Honour, a Past-president of the Statistical Society of Paris, an Honorary Fellow of our own Society, M. de Foville won by his talents recognition in many different spheres, and many, indeed, are the organisations who mourn his death, while to those who enjoyed his more intimate friendship the sad event brings a poignant grief at the break of an intercourse so replete with pleasure. The memory of his charming personality and his eloquent voice will long survive in the heart of every statistician.

P. G. CRAIGIE.

The Right Hon. Lord Avebury, F.R.S.

By the death of Lord Avebury—which occurred on May 20, in his eightieth year—the Society loses an Honorary Vice-President of high distinction, whose name had been on the Society's list of Fellows since 1865. In that year, on the proposal of Dr. William Farr, he was elected a Fellow, and in 1868 he became a member of the Council, on which he served until 1869 and again in 1882. He became a Vice-President in 1889, and in 1900 he was elected President. He continued in office until the end of the following Session, 1901-02, and, in spite of the great demands upon his time, he contributed two Presidential Addresses to the Society's transactions. From 1872 to 1899 he was a Trustee for the Society. It should be added that in 1903 he was admitted an Honorary Member of the International Statistical Institute.

His early interest in the Society's work is manifested by the fact that, shortly before his election in 1865, he read a Paper before the Society on the "Country Clearings," and from that date until his election as President his connection with the Society was a close one. As Sir John Glover said in seconding the vote of thanks to Lord Avebury for his second Presidential Address, "This is not the first obligation under which Lord Avebury had laid the Society. They had had a long experience of his kindness, and of the light which he always threw on any subject which he touched." It is noteworthy that Lord Avebury's contributions to the Society's transactions dealt with subjects of urgent national importance. The first Presidential Address discusses the "Growth of Municipal and National Expenditure," the second is an inquiry into "Local and Imperial Burdens"; both addresses are vigorous in manner and wide in scope, nor can either be described as other than highly controversial in character. They certainly reflect Lord Avebury's attitude towards statistical science (and perhaps to scientific research generally), inasmuch as they boldly apply a statistical, or scientific, test to far-reaching issues of great practical difficulty.

To Lord Avebury's activities in other fields, and to the success and distinction which he attained in all of them, there can necessarily be only a passing reference in this *Journal*. It is perhaps sufficient to say that the Society, while under Lord Avebury's guidance, had the advantage of a mind enriched by an almost unrivalled experience in many departments of scientific, public and commercial life. His friends and advisers were the intellectual giants of a great epoch in the history of science; the society to which, from his early days, he was admitted included such names as those of Faraday, Airy, Herschel, Huxley, Herbert Spencer,

the Mills, and Darwin. It is interesting to record that as early as 1857 Darwin was in correspondence with Sir John Lubbock (as Lord Avebury then was), and in regard to a question of statistics. Darwin, who was at work on his book on the "Origin of Species," required assistance in regard to statistics of varieties in species as deduced from floras. Having received the information desired, Darwin wrote, "You have done me the greatest possible service in "helping me to clarify my brains. If I am as muzzy on all subjects "as I am on proportion and chance—what a book I shall produce!"

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*La théorie de l'homme moyen: essai sur Quetelet et la statistique morale.* Par Maurice Halbwachs. 180 pp., Svo. Paris: Félix Alean. 1913. Price 2 fr. 50 c.

In this small volume M. Halbwachs has undertaken a critical study of Quetelet's conception of the "Mean Man"—a mean more or less unalterable, and representing an ideal type from which deviations may be regarded as accidental. The criticisms to be made depend naturally, in part at least, on the field in which the conception is applied: the author deals therefore in the first place with the physical characters typified by stature, next with such physical phenomena as natality and mortality, and finally with "l'homme moyen moral" and Quetelet's discussion of the data respecting marriages, crimes and suicides, summarising his conclusions at the end of the volume.

The fact, argues M. Halbwachs, that the frequencies of a physical character on either side of the mean decrease according to a regular law "peut être l'expression du fait que les modes de conformation des organes, dans l'espèce, et que leurs habitudes, se groupent régulièrement autour d'une moyenne, mais cela ne préjuge pas du tout des causes de cette répartition. Loin d'invoquer le hasard et le désordre, pourquoi ne point y reconnaître une loi de l'espèce, dont les membres ne sont certainement pas indépendants les uns des autres, qui peut être ne peut subsister . . . dans des conditions physiques et sociales définies, que parce qu'elle comprenait en même temps . . . des types individuels opposés, et en nombre tel de chaque côté de la moyenne qu'ils s'équilibrent?" Why, he asks, should we conceive the species as a type from which the individuals only deviate by accident (pp. 60-61)? Further, the causes that lead to deviations from the mean cannot all be termed accidental causes. Mortality, for example, conditions the formation of the frequency distribution of statures of adults, and mortality is a definite factor that can be influenced by social action. The distribution is also affected by the free intermarriage of persons of different statures and while this

introduces "an apparent disorder," it also introduces another factor that depends on a definite social organisation. If we turn to such phenomena as natality and mortality, we again find great scope for the action of definite causes and for the influence of the social organisation: constant social causes intervene, and their influence explains the regularities observed (p. 99). When we pass further to moral phenomena, such as crimes, the influence of the environment is of more importance still. Crime does not result solely, nor perhaps principally, from physiological causes, as Quetelet himself recognised. The constancy of the criminality in a given society depends on the constancy of the conditions in that society. Quetelet further held that the mean represented the best, the ideal: but there seems no reason for conceding this. Societies evolve, and may be resolved into groups which themselves evolve. There is a perpetual effort to reach adaptation, and the mean at any time is not necessarily an ideal.

This is, of course, a very inadequate summary of the arguments put forward by M. Halbwachs, and the reader who is interested should study the original carefully. With the general conclusions that the mean cannot be held to be fixed, that it is to a greater or less degree a function of the environment (including the social organisation), and that it is by no means necessarily the ideal, most readers would now be in agreement with the author. Some of his arguments are, however, difficult to follow and a few statements rather difficult to accept. To assimilate the frequency distributions of organic characters to chance distributions is not necessarily equivalent, for example, to asserting that the elements from which the characters result are absolutely independent of one another: the elements may be more or less interdependent, as Edgeworth has shown, without destroying the form of the normal law. Again, is it *sufficient* to say, as Mr. Halbwachs argues, if we rightly understand him, that the constancy, *e.g.*, of the suicide rate is evidence chiefly of the constancy of the social environment? Surely this can only account in a rough and general way for the constancy of the mean rate: the magnitude of the deviations from year to year, given constant population and a fixed environment, are matters that must be considered in the light of the theory of probabilities and with which that theory is adequate to deal. And the same remark applies in other cases: constancy of the environment, social organisation, &c., is necessary to account for the absence of any secular movement in the mean, but the theory of probability is necessary to indicate the limits of casual fluctuations. G.U.Y.

2.—*Income taxation—methods and results in various countries.* By Kossuth Kent Kennan. 350 pp., 8vo. Milwaukee, Wisconsin: Burdick and Allen, 1910. London: P. S. King and Son. Price \$3.50.

This valuable work made a timely appearance just at the beginning of that revival of interest in income taxation which is now fully manifest in the United States. Negligible as a contribution to economic theory or abstract speculation, it aims at presenting a

great mass of facts concerning the income-tax laws of many countries, with the latest statistics of their yield and effects, in order to furnish for students, legislators and administrators a reliable *valet mecum* in the task before them. Published in Wisconsin, it was swiftly followed by the new income-tax law of that State in 1911—the most thoroughgoing and complete experiment of its kind yet made in the United States. At the head of the administration of this new law is the author of this work, and traces of the results of his inductive study may be discerned by any careful student of the system of taxation now in force. The advent of a federal tax has doubtless made the book still more in demand in America, where it has been received with a chorus of praise by officials and legislators.

All other works upon the subject, in English, are much more restricted in range, even if more exhaustive in treatment of the portions with which they deal. The work most comparable with this one is the British Blue-book on Income Taxes in Foreign Countries, published in 1905, now fast becoming obsolete, but to be replaced shortly by a similar work called for by motion in Parliament. But the Blue-book differed from the present work in not containing the statistical results of most of the systems, and these are here furnished for the last year available in 1910. Under each country is given an outline of the tax system with limits of exemption and abatement or graduation, rates of tax, the total yield of the tax, the proportion borne by this yield to the total revenue, and the cost of collection. The proportion referred to is an uncertain quantity because of the various ways in which gross receipts are computed, and the inclusion therein of profits or receipts from railways and public utilities, but Mr. Kennan reaches the interesting conclusion, by tabulation of the statistics, that in the aggregate of 37 countries the income tax contributed almost exactly 50 per cent. of the total sum raised by taxation; but he does not state whether this is an average of the percentages or the percentage borne by the aggregate income tax to aggregate tax revenue. It would seem that it must certainly be the former; and this supposition is supported by the author's remark that "the percentages are highest in the minor German States, sometimes exceeding 80 per cent." These cases would have an important effect on the average of percentages, but little on the percentage of aggregates.

The summary contains the results of other statistical inquiries which, though briefly stated, represent considerable labour and research. The troublesome task of reducing exemption limits to a common term has been attempted, and from 56 countries which have such limits an average of about 82*l.* is obtained, and this average is resolved into two others, viz., that for the "English-speaking group" of 16 systems, about 220*l.*, and that for the "Continental group," with Japan, 40 systems in all, about 31*l.*

The proportion of income-tax payers to population is available in some 20 cases, comprising most of the larger countries. The proportion over the whole of these cases is 3½ per cent. In this case the author seems to have aggregated the cases and not to have

averaged the percentages, for he remarks, "But if India is omitted, as it perhaps should be owing to exceptional conditions which prevail there, the rate for the remaining 19 countries rises to 10 per cent." The author might well have avoided the ambiguities arising from the change in method, and an indication could have been readily given by him as to whether the percentage varied inversely, with any regularity, as the exemption limit—a result that would be expected with similarity in distribution of income. Perhaps Mr. Kennan's most valuable contribution to statistics is in connection with the rates of tax. The actual sum payable at 10 levels of income, 100*l.*, 200*l.*, 400*l.*, up to 20,000*l.*, has been ascertained for 40 different systems, and the resultant percentage averaged, in the result ranging from 1.54 per cent. (on 100*l.*) to 3.79 per cent. (on 20,000*l.*). This again is resolved into the English group 1.76 per cent. up to 3.28 per cent., and the Continental group 1.48 per cent. to 4.15 per cent. It is necessary to remember always that these percentages represent nothing more than the average of forty *ideas* as to what progression in taxation should be. We have again the difficulty or defect which seems to be inherent in all inductive treatment of the subject—the necessity for putting on an equal footing great systems like the British or Prussian, and the insignificant systems of colonies, German principalities, or Swiss cantons. The effect of abnormal instances, insignificant from a practical point of view, may be so considerable that before it can be truly stated that we have ascertained the average progression applicable to the world's income taxation, some kind of weighted average is essential. Whether such weights would be best provided by regarding total income tax yield, numbers of taxpayers, or total population is a matter for nice consideration. The author has evidently realised the difficulty in some measure, for he has omitted Japan in this connection, "as the rates are quite excessive." The results have been graphically set out in a pleasing manner.

There are many other features of interest; and even when some parts of the work necessarily become out of date, much of the statistical work will render the book permanently valuable as a work of reference. But a second edition should be forthcoming in due course, in which some of the relatively few defects are remedied. In format, the volume is much above the average for this class of work.

J.C.S.

3.—*Dell' Emigrazione Italiana [Cinquanta anni di Storia Italiana (1860-1910)]*. By Francesco Colletti. xii + 278 pp., 8vo. Milano: Ulrico Hoepli, 1912. Price 10 lire.

Alarms of the prospective depopulation of this country through emigration are favorite topics with the daily Press at the present time. We, however, have a substantial population to draw upon, and the bulk of the emigrants do not lose their nationality, as they go to supply the needs of our expanding Dominions beyond the seas. In the case of Italy the subject attains special interest by reason of the smaller population drawn upon, and the further fact that most of the emigrants are lost to the Nation, being absorbed in the populations of foreign countries.

The interest which the question excites in the minds of Italians is evidenced by the book now before us, which deals exhaustively (278 quarto pages) with the subject in many aspects. In his foreword the author subdivides his subject under the following headings, viz., the sources of his statistics; the analysis of the available data; the causes of emigration; the prosperity (or otherwise) of emigrants in foreign countries; the effects of emigration; the security of emigrants—both public and private; the future of Italian emigration; and conclusions—a scheme of work sufficiently comprehensive to satisfy the most exacting.

Records of emigration have been kept in Italy since 1869, at first apparently more or less unofficially (1869-75); from 1876-1901 by the Bureau of Statistics, and since 1902 by the Emigration Commissioner. In addition to the above, use has been made of all foreign statistics which show the nationality of immigrants, of the records of return of migrants from oversea countries kept by the Emigration Commissioner, of the civil registers prescribed by the Royal Decree of September, 1901, and of the census returns both home and foreign.

In 1871, 455,000 Italians were enumerated in foreign countries, nearly half (47.48 per cent.) in America (North and South). In 1881, the number had increased to 1,032,392, America again having the lion's share (56.12 per cent.), and in 1909 to 5,476,255, the American proportion rising to 81 per cent. Emigration to European countries, to Africa, India and Australasia has steadily declined. The annual rates of emigration have increased from 39.5 per 10,000 inhabitants in 1876 to 188.4 in 1910. The rate averaged 47 per 10,000 in 1876-86, rising to 87 in 1887-1900, and 179 in 1901-09. Taking the number of emigrants in the first period as 100, those in the second and third were equivalent to 200 and 443 respectively, showing a steadily and (in later years) rapidly increasing drain on the country. In the first period, emigration was greatest from Northern Italy (68.28 per 10,000 inhabitants), Southern Italy and the Islands ranking next (20.71), and Central last (11.01). In 1901-09, Southern Italy and the Islands lost most population (46.63), Northern being next (35.30), and Central again last (18.07). Taking, however, the growth of emigration between the two periods, that from Southern Italy and the Islands has been greatest (898 per cent.), Central coming next (628), and Northern last (129). The flight from Umbria and Lazio during the whole period has increased enormously, the index-numbers for those districts in 1901-09 being 30,700 and 37,191 respectively (1876-86 = 100).

The proportions of men and women emigrating have not varied very greatly, but on the whole more women leave the country now than they did formerly. The age limit of minors has been changed two or three times, and whereas the term was applied to children under 14, it now includes those who have not passed their fifteenth year. Emigration of whole families was at its highest in 1894-96, when close on 41 per cent. of the emigrants "left with other members of their families," at its lowest in 1907 and 1908, and was inclined to increase during 1909 and 1910.

The preponderating social classes among the male emigrants are those connected with agriculture (in all its branches), but although there has been a marked increase in the actual numbers emigrating, the percentage they form of the total emigration has decreased in later years (since 1904). The more skilled trades, on the other hand, show a tendency to an increased proportion. It should, however, be observed that the foregoing remarks are based on annual numbers, and that considerable variations in a succession of years are recorded in all groups. Of the female emigrants nearly half in the later years are entered as "Occupation unknown," but an examination of the figures suggests that there has been a considerable transference from the definite classes to the "unknown" in recent years.

Distinction is made in the returns between the numbers of each class leaving the country for short terms and those definitely emigrating. The numbers in each category have increased largely, but the increase of permanent emigrants is very much greater than that of the temporary. In 1909 the net loss of population through emigration, after allowing for immigration (of Italians), was estimated at just over 30 per 1,000 inhabitants.

Serious as the numerical loss of population appears to be when set out statistically, the Author does not appear to be prepared to condemn it as an unmixed evil, and he joins issue in no hesitating language with those pessimists who see national ruin in emigration. There are, he points out, certain advantages of no small importance, which need to be set off against the one positive fact, viz., loss of population. Among the advantages he includes the better knowledge of hygiene which is diffused (by the emigrants abroad or on their return) among the inhabitants remaining at home. In the southern parts of Italy, the view commonly expressed is that if there had been no emigration, the inhabitants would have been compelled to eat each other to avoid death by starvation—a fairly emphatic form of popular approval of the present *régime*. The author looks upon emigration as an evidence of the virility of the nation. Nevertheless, he desires that the State should take measures to foster the home-loving and home-staying character of his countrymen, and urges the increase of facilities for obtaining loans and for the acquisition of land. Lastly, he sees in the readiness with which his countrymen in America, and other distant countries, sacrificed their positions to return to the country to answer the call to arms in the recent Tripolitan campaign, a splendid example of the fidelity of Italians to their own nation and kin. Many of those who so responded were naturalised Americans, but they had not lost their love for their motherland—a conclusion which negatives the assumption of loss by absorption with which we prefaced this note.

Criticism of the author's work has not been present in our mind in writing the above paragraphs. We have endeavoured to present the salient points of the book, so far as is possible in the limited space at our disposal. We would urge those interested in questions of emigration to study the book itself, which we have found to be of very great interest.

R.D.

4.—*Essai sur le problème de la misère. L'aide sociale aux nécessiteux adultes valides.* [Les Miséreux. 3ième partie]. Par Anatole Weber. xi + 493 pp., 8vo. Paris: Rivière, 1913. Price 5 fr. net.

There is a curious inconsistency between the cover and the title page of this work. In the former it is stated to be the "troisième" édition; in the latter the "quatrième." Whichever is the correct figure, the public appreciation of a valuable work by a well-known author is in either case sufficiently marked. Previous volumes of the series have dealt with assistance to the destitute in foreign countries and in France respectively, and M. Weber is a recognised authority on the subjects of providence and mutuality. His object in the present work is to discuss, theoretically and practically, what are the most rational methods in which to aid healthy adults in distress. That these should exist appears to him to be essentially the weak point of our social organisation. He divides his essay into five parts: in the first, he poses the question; in the second, he traces the evolution of ideas, of organisms, and of methods in the matter of assistance; in the third, the remedies employed; in the fourth, he discusses new conceptions; and in the fifth, practical realisations of them. A note annexed deals with the terminology of the subject.

It may be as well to state, at the outset, how these questions of terminology are dealt with. The "individual" is described as a human being, living in society, and consequently not considered as a solitary moral person, but as a social unit; the "adult," as an individual who shows himself or is shown to be capable of providing for his own wants by his own resources; "validity," as physical and moral aptitude for labour; and "labour," as a troublesome (*penible*) effort made in view of remuneration. Definitions of other words used in the work are given, which are to be borne in mind in considering the author's arguments. Speaking generally, he holds that the "miséreux," the valid adult who is in "misère," is the creature of his own moral defect, and that the methods of charity have tended to make him worse instead of better. From this consideration M. Weber proceeds to the study of past times, and, after a long and learned discussion of modes of assistance, shows that the intervention of the State has been steadily increasing with respect to administration, to management, and to financial provision, and now holds the first place. The observation appears to have primary reference to France, but it is not altogether inapplicable to other countries.

The author discusses with some severity, the psychology of charitable acts. He quotes, from Victor Hugo, the poem beginning:

"Donnez, riches! L'aumône est sœur de la prière,"

and ending:

"Donnez, afin qu'un jour, à votre heure dernière,
Contre tous vos péchés vous ayez la prière
D'un mendiant puissant au ciel."

He arrives at the pessimistic conclusion that by closing the eyes of the rich to their real obligations, by degrading the poor and

permanently demoralising those who have once been assisted, and by vitiating the relations of individuals to the State, charity has rather created and increased misery than mitigated it: and that neither repressive measures, nor providence, whether individual, collective, or social, though useful as a palliative, can be considered as a serious or effective remedy for the evil.

The remedy which he suggests is dependent on the principles that assistance should be applied to all and help should be immediately accorded to every one who is in need; that it should depend upon the reality of the need, and not upon any other consideration; that it should be sufficient to satisfy that need; and that it should safeguard the dignity of the receivers and have no humiliating element. In other words, he would give a right to relief out of public funds, under the title of "social aid to necessitous valid adults." This, he says, is no novelty. It was proclaimed by the Convention in 1790. The recent enactments granting gratuitous medical assistance, and allowances to the aged, the infirm, and the incurable, are steps in the direction of recognising a right to help. For the funds to meet the claims, he would follow the English precedent and impose a poor's rate: though he thinks the hour has not yet come to put his proposals into effect. For the present, he is satisfied with having shown that they are logical, practical, and easily realisable. Whether we shall all agree with him in this respect is doubtful: but at any rate we may thank him for an interesting discussion of a difficult question. E.B.

5.—*Vers le salaire minimum. Etude d'économie et de législation industrielles.* Par Barthélemy Raynaud. xi+518 pp., 8vo. Paris: Librairie de la Société du Recueil Sirey, 1913. Price 12 fr. 50 c.

It would be an excellent thing if writers who deal with the "minimum wage" began by defining the meaning of the words. Towards the end of the book we are thrown into great confusion by reading: "Un minimum de salaire, c'est d'abord le juste salaire: a fair wage for work done," and again "Le minimum de salaire c'est donc . . . le salaire le plus bas encore convenable qui puisse être payé" (p. 451). These are in opposition to "salaire le plus bas qui puisse être effectivement payé" (p. 449). Earlier (p. 74) he speaks of low current wages as "véritables minima," and on pp. 240-1 remarks "Lors du vote du budget de 1911, les Chambres ont fixé un minimum de 1,200 francs comme traitement de début; c'est une amélioration sensible pour les employés . . . , sans être encore un véritable minimum de salaire. In fact "minimum wage" involves a qualifying clause in ordinary discussion, such as "that is recognised by trade unions," or "that is allowed by law"; and the book deals with the various methods by which wages have been fixed so as to replace those that would be obtained under free competition. The author does not face the economic questions of the effect on employment or prices or the total product of industry of such adjustments of wages, but only alludes to these in passing; the book is definitely weak on the theoretic side.

On the analytical and descriptive side, however, Professor Raynaud is clear, interesting and very well informed. He is

admittedly in accordance with Mr. Sidney Webb's views, and the book is definitely a plea for the more general establishment of minima below which wages should not be paid; this leads him to give a somewhat one-sided account of the working of the laws in Australia. The method which he approves most heartily is that adopted in the "Act to provide for the establishment of Trade Boards for certain trades" in 1909 in Great Britain.

The main part of the book is devoted to an analytical account of the various methods by which the fixing of wages has been approached in different countries. The fair wage clause in contracts, relating wages to those currently paid, is described at length, with an account of its imperfect success in France. The history of trade union action in respect of wages is sketched. An interesting chapter is devoted to the State as employer, which brings out the significant fact that in France more success is obtained in raising wages to an adequate standard in those cases where the Government has a monopoly (tobacco, matches, postal service) than in those where it faces opposition (railways, dockyards). The official policy is described thus: "La Commission émet le vœu que l'on mette à l'étude la question de faire entrer les nécessités de l'existence comme élément d'appréciation de la détermination du Salaire" (p. 229), and "l'Etat employeur doit assurer . . . ce minimum de bien-être qui suppose un salaire suffisant pour ses besoins et ceux de sa famille" (p. 230).

The general impression one obtains from the various attempts, many of them successful, to fix a lower limit to wages, is that the advocates of a fixed minimum have not clear ideas of their objective; sometimes it is to level up wages to the best paid for every class of work, sometimes to ensure at least a bare independent subsistence wage, sometimes to raise both men's and women's wages to such a height that either could support a family; and in some cases it is hoped that the raised wage will pay itself from more efficient work, in others the possibility of unemployment is realised but no remedy is proposed.

A.L.B.

6.—*La classe ouvrière et les niveaux de vie. Recherches sur la hiérarchie des besoins dans les sociétés industrielles contemporaines.* Par Maurice Halbwachs. xvii + 495 pp., 8vo. Paris: Librairie Félix Alcan. 1913. Price 7 fr. 50 c.

This study is based principally on two reports (*Erhebung von Wirtschaftsrechnungen minder bemittelter Familien im Deutschen Reiche, and Haushaltungsrechnungen von Metallarbeitern*) which appeared in Germany in 1909. Their results are analysed from various points of view, and are in particular used to test Engel's law as to the relation of expenditures on food, clothing and housing to income. The author finds that on the whole Engel's law is not sufficient; that there is great variation due to the varied constitution of a family and to inherited or fortuitous habits. He endeavours to estimate the importance of the pressing needs of family life, and arrives at the conclusion that with the working class the demand for good housing is soon satisfied and that the

surplus is devoted to expenditure outside the house. There is no continuous sequence from one level of domestic economy to another, but rather the standard of living changes by jumps, and it is rare that a family passes from one level to another. The documents used appear hardly general enough to warrant any very definite conclusions, and the argument of the book is difficult to follow owing to its prolixity and repetition. A great part is not statistical, but a rather thin discussion of the significance of the term working-class and its various sections. A.L.B.

7.—*Arbeitslohn und Arbeitszeit in Europa und Amerika, 1870-1909.* Von R. Kuczynski. 817 pp., la. 8vo. Berlin: Verlag von Julius Springer, 1913. Price 24s.

This volume, bulky as it is, contains less than its title seems to indicate, for there appears to be no material relating to Europe outside Germany, except that published for a very few towns and industries, for years prior to 1904, by the United States Labour Department. The information relating to U.S.A. and to Germany is given in very great detail, and a great amount of material (especially for the latter country) is here published for the first time. No student of German wages can afford to neglect this material, but it is by no means complete, as it relates only to building, printing, and stone-work in its more detailed second part, with the addition of the machine industry and woodwork in its first. The tables are not summarised, and there is no attempt at any general conspectus either of the rates of wages, their changes, or the duration of work. It is to be hoped that the author will make his probably very valuable material accessible to students, by publishing a brief analysis and summary of the results he has obtained; for no one but the compiler of such data can really understand their significance. A.L.B.

8.—*English Local Government: the story of the King's highway.* By Sidney and Beatrice Webb. x + 279 pp., 8vo. London: Longmans, 1913. Price 7s. 6d. net.

In this *Journal* for December, 1906 (lxix, 783), we had the pleasure of noting the first volume of this excellent series of works, that on the Parish and the County. It was followed in due course by two volumes relating to the Manor and the Borough (reviewed in the *Journal* in 1908, lxxi, 418) and the orderly sequence, which would have led to a fourth volume, dealing with the development of local government under various statutory bodies in modern times, has been interrupted for a time in order to produce the present work on road administration, the materials for which had been more fully collected. Like its predecessors, it is learned and thorough. The statutes cited in it are not far short of two hundred. The authors adopt a convenient course in giving the text without any interruption, and reserving for "the reader who likes footnotes and references" (among whom we presume to count ourselves) an appendix at the end of each chapter, in which the authorities for the statements made in the chapter are fully set forth. The scope

of the book is a wide one; it "begins with the war chariot of Boadicea, and is brought down to the motor omnibus of to-day."

Obviously, the aborigines of the country made their roads by the simple process of walking or driving their cattle as nearly as might be in a straight line to the place to which they wanted to go, a process which in time would create a beaten track in that direction. The traces that remain of any roads that may have existed before the advent of those great road-makers, the Romans, are few, and of the management and maintenance of such roads we know nothing. A reference in the appendix to chapter I, to articles in *Archæologia*, by the late Dr. Phené, we have not been able to verify, but the argument of the late Mr. Alfred Tylor—that the Britons had roads along which chariots could pass—appears to be sound. The authors adopt the opinion of Forbes and Burmester that the durable roads were exceptional, and that the old lines of traffic were tracks from the high ground where the people lived to the fordable rivers and shipping ports.

The splendid straight lines of the Roman roads, which can still largely be traced, belong to the military administration of the country, and we know nothing about their organisation and working. The authors consider that they were used almost entirely by pedestrians and horses, and there is ample evidence of their continued use after the Romans had departed.

The first statute which organised the maintenance of roads for the whole of England was passed in 1555; and the authors "know of no study of the highway legislation of the sixteenth and seventeenth centuries, for which the sources are the statutes themselves" and "are not acquainted with any account of the origin or authorship of those statutes or of the circumstances of their enactment." They were repealed and codified in 1766. The Act of 1555 created the office of Surveyor of the Highways, and the obligation upon the occupying inhabitants of the parish to contribute labour and materials to the carrying out of the work of that officer. The government of the Commonwealth substituted for this obligation, which had been frequently commuted into a money payment, a compulsory tax for road maintenance: but all their wise and bold legislation was declared invalid at the Restoration, and we have since been gradually "picking up and hesitatingly re-enacting imperfect scraps" of it. With great industry and research, the authors have pieced together the evidence from parishes in all parts of the country of the working of the Highway Acts, and of the proceedings by presentment and indictment that grew up to enforce them. They state, no doubt correctly, that until late in the eighteenth century travellers went on horseback. One illustration they give of this statement is curious: "It was in this way that Samuel Wesley took all England for his parish." This must surely be a slip for John Wesley, the son of Samuel, and the saying attributed to him was that he took the world for his parish. In the later years of his life he used a carriage. Some interesting statistical details of the traffic of cattle for the provisioning of London and other great towns are given.

The chapter on the making of bridges opens with the statement, which will probably surprise the reader, that it was not made part of the common duty of any public authority until 1888, when it was imposed upon the new county councils.

For information as to the turnpike roads, the careers of Telford and Macadam, the road legislation of the nineteenth century, and the new users of the road in the present day, we must refer the reader to the book itself, and he will thank us for doing so, for it is interesting and informing from beginning to end, and supplies a very definite want. E.B.

9.—Other New Publications.*

Ashley (Annie). The Social Policy of Bismarck. A Critical Study, with a Comparison of German and English Insurance Legislation. 95 pp., 8vo. London: Longmans, Green and Co., 1912. Price 2s. net.

[This book gives a concise and clear account of Bismarck's social policy, and of its different stages, leading up to the establishment of the German insurance system, which is described in its historical development and in its present organisation. A comparison with the English system is also made, and the chief divergencies between them explained.]

Arenel (Vicente G. d'). Histoire économique de la Propriété, des Salaires, des Denrées, en 1200-1800. Tome vi. 690 pp., la. 8vo. Paris: Ernest Leroux, 1912. Price 16s.

[The present volume of this interesting work deals with the evolution of household and private expenses among different classes of the community in France during the sixteenth to eighteenth centuries. There are chapters dealing with the cost of food of the most varied kinds, cooked and uncooked, the cost of building houses and furnishing them in town and country, the wages paid to domestics of various degrees, and the cost of feeding and clothing them. In the table of prices in the appendix the original quantities and values are given with their modern equivalents.]

Barker (D. A.). The Theory of Money. 141 pp., sm. 8vo. Cambridge: University Press, 1913. Price 1s.

[Though little has been written in England in recent years on the theory of money, much has been written in the United States, where the theory of money has been carried definitely beyond the point at which it was left by Jevons. As many of the books are bulky, or too technical for the general reader, the author has attempted to explain the more important results of recent American work with the hope that readers will eventually turn to the original source.]

Bochard (A.). Les Lois de la Sociologie économique. 352 pp., 8vo. Paris: Marcel Rivière and Co., 1913. Price 8 francs.

[The author's endeavour is to ascertain what are the bases of society. These, he contends, are superposed on the material and intellectual work of successive generations, matured to an always increasing extent by inventions of one kind and another. The influence of these inventions on forms of government, law and scientific theories is discussed.]

Cunningham (G. H.). Increase in the National Death Rate from Heart Disease, Bright's Disease and Apoplexy. 29 pp., 8vo. New York, 1913.

* See also "Additions to the Library," page 736, *sqq.*

Jaecel (Dr. Reinhold). Die Selbstmorde im Kreise Teltow, 1810-1910. 26 pp., fol. Berlin: W. Koebke, 1912.

[A statistical study of suicides in the district of Teltow during the one hundred years 1810-1910. The relative numbers of suicides in town and country, and of males and females, are examined, and the influence of the proximity of Berlin on the relatively high rates of suicide prevailing in this district is also considered.]

Kurten (Dr. O.). Ergänzungshefte zum Deutschen Statistischen Zentralblatt. Heft 3. Statistik des Selbstmordes im Königreich Sachsen. 145 pp., 8vo. Leipzig: B. G. Teubner, 1913. Price 4s.

[A statistical study of suicides in Saxony during 1830 to 1909, in relation to locality, season, and social status.]

Leener (G. de). La Politique des Transports en Belgique. (Instituts Solvay.) ix + 320 pp., 8vo. Brussels: Misch and Thron, 1913. Price 3 francs.

[The author's endeavour is to show clearly the present position of affairs as regards questions of transport in Belgium. He is opposed to the extension of inland waterways, and contends that it is a mistake to suppose water traction is cheaper than traction by rail.]

March (Lucien). Observation et Stabilisation des Prix. 59 pp., la 8vo. Paris: Berger-Lévrault, 1913.

[Deals with Mr. Babson's method of the statistical observation of factors indicative of the general economic condition of a country, and also with Prof. Irving Fisher's scheme for the regulation and greater stability of prices.]

Minutilli (Gennaro). Nozioni di Scienza Attuariale. Matematica delle Assicurazioni. 87 Tavole. xiii + 329 pp., sm. 8vo. Milano: Ulrico Hoepli, 1913. Price 4 lire.

[A text-book dealing with the practice and mathematics of life assurance, and intended for the use of those engaged in actuarial work.]

Moride (Pierre). Les Maisons à Succursales multiples en France et à l'Étranger. 235 pp., 8vo. Paris: Félix Alcan, 1913. Price 3 fr. 50.

[A study of the economic and social effects of retail trading undertakings with branches spreading over large areas, yet under one central management and ownership. The author's work, which he believes to be the first of its kind dealing entirely with this phase of economic activity, reviews the working of these concerns in France and other countries. The book is at the same time a study of a new form of concentration, and a description of novel methods of retail trading.]

Supino (Camillo). La Navigazione dal Punto di Vista economico. Terza edizione rifatta ed ampliata. Studi Giuridici e Politici. 450 pp., 8vo. Milano: Ulrico Hoepli, 1913. Price 7 lire 50 c.

Tönnies (Dr. Ferdinand). Sammlung Göschen. Die Entwicklung der sozialen Frage. Zweite, durchgesehene Auflage. 160 pp., sm. 8vo. Berlin, 1913. Price 90 pf.

France. Enquête sur le travail à domicile dans l'industrie de la fleur artificielle. 426 pp., 8vo. Paris: Imprimerie Nationale, 1913.

[The making of artificial flowers in France is almost entirely a woman's occupation and is centred in Paris, although the industry is carried on to a certain extent in Lyons and one or two other towns. It is largely a home industry, and while the earnings vary according to the skill of the workers, some of them making 4 to 5 francs a day, there are others whose earnings do not exceed 1 franc a day, and who have to obtain assistance from the Poor Law authorities. The industry, in addition to

being badly paid, is an unhealthy one, even apart from the long hours of work of those engaged therein. It is suggested that the evils described might be lessened by the women learning the feather trade, which would help them over times of slackness when the fashion for flowers gives way to that for feathers and *vice versa*, as it appears to do from time to time. The other suggestion is the fixing of a minimum wage for home workers, and it is hoped the customs tariff of 1910, by keeping out foreign-made flowers, will help to better the condition of the home workers without injuring the industry as a whole.]

Paris. Recueil de statistique municipale. 1912. No. 5. Statistique des Logements à Paris. (Nombre de pièces. Nombre d'habitants.) 552 pp., 8vo. Paris, 1912.

[This return is the result of an inquiry into the housing conditions of Paris, made in 1911 by the Municipal Council of Paris. Though there is an improvement as compared with earlier inquiries, there were still 82 per 1,000 of the inhabitants overcrowded in 1911, as compared with 143 per 1,000 in 1901. The report emphasises the difficulty of the housing of large families.]

Spain. Estadística del Suicidio en España. Sexenio 1906-11. 332 pp., la 8vo. Madrid, 1913.

[A statistical study dealing comprehensively with suicides and attempts at suicides in Spain during 1906 to 1911. The report deals with suicides in the country as a whole, as well as in each of the 49 provinces, and in towns of over 10,000 inhabitants. The influence of sex, civil condition, age and occupation, education, criminality, climate and other factors is considered.]

Switzerland. 5^e recensement fédéral des ruches d'abeilles exécuté le 21 Avril, 1911. 4to. 1913. Price 1 franc.

Australia. Commonwealth Bureau of Census Statistics. Labour and Industrial Branch. Report No. 2. Trade Unionism, Unemployment, Wages, Prices, and Cost of Living in Australia, 1891 to 1912. 77 pp., 8vo. Melbourne: McCarron, Bird and Co., 1913.

[The object of this report is to present in concise and convenient form the results of certain investigations concerning trade unionism, unemployment, and changes in wages and hours of labour in the Commonwealth since 1891. Owing to lack of data bearing on these subjects in the past, it became necessary to collect the data *de novo* before any comprehensive or reliable results could be obtained.]

London County Council. Arrest in the Growth of the Rateable Value of London. 24 pp., fol. London, 1912. Price 6d.

[Mr. Spensley, in his report, examines the results of previous quinquennial valuations, and the results for various classes of property. He finds there has been an increase in the rateable value of public service undertakings, except railways, and a large decrease (20 per cent.) in the rateable value of licensed premises, due mainly to the Finance (1909-10) Act, 1910; and decreases in the rateable values of industrial and business premises and residential property, the latter implying a slight lowering of London's high rent standard as compared with other large towns.]

CURRENT NOTES.

The trade returns again show an increase in the value of both imports and exports. The subjoined tables compare the returns of the twelve months ending May, 1913, with the twelve months ending May, 1912:—

[000's omitted.]

Exports.	Twelve months ending May, 1913.	Twelve months ending May, 1912.	Increase (+).
Exports of produce and manufactures of the United Kingdom, value f.o.b.—	£	£	£
I. Food, drink and tobacco	32,564,	29,374,	+ 3,190,
II. Raw materials and articles mainly unmanufactured	59,388,	54,572,	+ 4,816,
III. Articles wholly or mainly manufactured	390,611,	362,099,	+ 28,512,
IV. Miscellaneous and unclassified (including parcel post)	9,897,	9,292,	+ 605,
Exports of foreign and colonial merchandise, value f.o.b.—			
I. Food, drink and tobacco	15,187,	14,024,	+ 1,163,
II. Raw materials and articles mainly unmanufactured	65,947,	61,941,	+ 4,006,
III. Articles wholly or mainly manufactured	29,086,	28,636,	+ 450,
IV. Miscellaneous and unclassified (including parcel post)	162,	149,	+ 13,
Total, British, foreign and colonial	602,842,	560,087,	+ 42,755,
Exports of bullion and specie	64,554,	56,127,	+ 8,427,

[000's omitted.]

Imports.	Twelve months ending May, 1913.	Twelve months ending May, 1912.	Increase (+).
Imports, value c.i.f.—	£	£	£
I. Food, drink and tobacco	283,017,	264,271,	+ 18,746,
II. Raw materials and articles mainly unmanufactured	278,308,	248,710,	+ 29,598,
III. Articles wholly or mainly manufactured	186,863,	165,790,	+ 21,073,
IV. Miscellaneous and unclassified (including parcel post)	2,919,	2,520,	+ 399,
Total merchandise	751,107,	681,291,	+ 69,816,
Imports of bullion and specie	68,719,	62,520,	+ 6,199,

[000's omitted.]

Shipping.	Twelve months ending May, 1913.	Twelve months ending May, 1912.	Increase (+).
	Tons.	Tons.	Tons.
Total, British and foreign, <i>entered</i> } with cargoes	46,861,	41,925,	+ 4,936,
Total, British and foreign, <i>cleared</i> } with cargoes	62,054,	59,550,	+ 2,504,

Mr. Sauerbeck's index-number for May, as given in the *Statist*, is 85·7, as against 86·2 in April, the average of the eleven years 1867-77 being taken as 100. With the exception of minerals all the groups showed a decline, which was specially marked in foodstuffs. There was also a small decline in textiles and in sundry materials. The commodities which rose in price were oats, mutton, bacon, iron, copper, lead, timber and leather, and the most noteworthy falls were in rice, pork, sugar, tin, flax and seeds. Articles of food were 77·2, as against 78·3 in April, and materials remained at 91·9. The *Economist* index-number is 2,694, as compared with 2,729 in April.

According to the Board of Trade *Labour Gazette*, the state of the labour market in May was as follows:—

	Trade unions making returns. Net membership.	Reported as unemployed.	
		Number.	Percentage.
April, 1913	912,046	15,719	1·7
March, 1913	908,276	17,533	1·9
April, 1912	833,019	30,222	3·6

Employment in April was very good, especially in coal mining, engineering and shipbuilding. There was a seasonal advance in the building, brickmaking and woodworking industries, and some improvement in the printing trades. On the other hand, employment at iron and steel works showed a decline from the previous high level, while the tinplate trade continued to be affected by adverse conditions. Textiles on the whole showed no marked change. It is reported by the Labour Exchanges that there was a continuance of the large demand for workmen of all classes in the shipbuilding trades, and in the engineering and building trades there was a scarcity of labour in some districts, while painters were in general demand. In the case of women the demand exceeded the supply in the cotton, woollen, worsted, linen and clothing trades, and in laundry work. There was also a scarcity of women

in the Birmingham jewellery trade. The upward movement of wages continued. Compared with a year ago, when employment had not fully recovered from the effects of the great coal dispute, all the principal industries, except tinplate, showed an improvement.

The first report of the Board of Agriculture for Scotland [Cd-6757. Price 5½d.] has been issued. The Report deals with the work of the Board during the first nine months of its existence, *i.e.*, since its creation on April 1, 1912. By the Act under which the Board is constituted the Board is charged with the general duty of (i) promoting the interests of agriculture, forestry and other rural industries in Scotland; (ii) the collection and preparation of statistics relating to these subjects, the making, or aiding in making, inquiries, experiments, and research, and the collection of information relating thereto; (iii) promoting, aiding and developing instruction in agriculture, forestry and other rural industries. The Board is also to take such steps as may appear proper for the promotion and development of agricultural organisation and co-operation. As regards the collection and preparation of statistics, arrangements were made with the Board of Agriculture and Fisheries that the statistical work done by them in Scotland should in future be undertaken by the new Board. These arrangements have become effective at various times since the Board was established.

The first report has also been issued (by the Scotch Education Department) on the Medical Inspection of School Children in Scotland. The report, which is by Dr. W. Leslie Mackenzie, Medical Member of the Local Government Board for Scotland, is based on the report of the school medical officers for the school year ended July, 1911. In this report attention has been concentrated on the larger aspects of medical inspection—the history and organisation of the movement, the sanitation of the schools, the personal hygiene of the children, and the general results in town and country. It is stated that there has deliberately been no attempt for the present to discuss statistical materials, which, though very important, are not yet by themselves sufficient to form the groundwork of general conclusions.

A Paper by Dr. A. K. Chalmers, Medical Officer of Health of Glasgow, on "The House as a Contributory Factor in the Death-Rate," has been reprinted in pamphlet form from the *Proceedings of the Royal Society of Medicine*. Dr. Chalmers discusses the influence of the house on the health of its inmates from the point of view of age-distribution. At the 1901 census Dr. Chalmers compared the

death-rates obtaining in the population of Glasgow in regard to the size of dwelling-houses, and, although the difference between the extremes was so great as to suggest a discrepancy in the units compared, lack of information regarding the age-distribution of the several populations made it impossible to carry the comparison beyond a simple statement of the relative prevalence of certain groups of disease among them. The element which was lacking in 1901 was supplied by the 1911 census, and the first scrutiny of the age-distribution suggested that a very considerable portion of the differences in the death-rate could be ascribed to the large proportion of children in the smaller houses. It showed, for example, that while 11 per cent. of the total population consisted of children under 5 years, in the one-apartment population they found almost 19 per cent., and in the two-apartment almost 14 per cent.; while in houses of three and four apartments and upwards the proportions were 7 and 4 per cent. respectively. A further point of importance emerged when the deaths were cast for these several groups of the population in the disclosure that even when corrected for age-distribution the death-rate of the population occupying four apartments and upwards was slightly under 12 per 1,000 (in a population of over 160,000), a quite unlikely, if not indeed a wholly impossible, rate in any mixed population living under existing conditions. Dr. Chalmers is of opinion that in view of the very low death-rates—the general death-rate since 1901 shows a reduction of over 19 per cent.—the several groups of the population he examines cannot be regarded as in any way permanent sections of a population. They suggest rather the ebb and flow of families caught in successive waves of good or evil fortune. This interchange is traced as taking place to a recognisable extent in the one- and two-apartment population, though there are not means of determining at present whether it is also in progress between the occupants of three and four apartments and upwards.

The first number has been published of a series of memoranda on problems of poverty which are being issued by the Ratan Tata Foundation of the University of London. The Ratan Tata Foundation has been instituted in order to promote the study and further the knowledge of methods of preventing and relieving poverty and destitution. For the furtherance of this purpose the Foundation conducts inquiries into wages and the cost of living, methods of preventing and diminishing unemployment, measures affecting the health and well-being of workers, public and private agencies for the relief of destitution, and kindred matters. The results of its principal researches will be published in pamphlet or book form.

In addition to these methods of publishing information, the officers of the Foundation will, as far as is in their power, send replies to individual inquiries relating to poverty and destitution, their causes, prevention and relief, whether at home or abroad. Such inquiries should be addressed to the Secretary of the Ratan Tata Foundation, School of Economics, Clare Market, Kingsway, W.C. The officers are also prepared to supervise the work of students wishing to engage in research in connection with problems of poverty. In addition, courses of lectures will be given from time to time; the first course, introductory to more advanced investigation, will be given by the Director of the Foundation, at the London School of Economics, in Michaelmas, 1913. These courses will be open to the public.

The present pamphlet, which deals with the incidence of taxation on the working-class family, is by Mr. F. W. Kalthammer, M.A. The writer treats his subject under three heads, viz., method and source of taxation, food taxation, and taxation of alcohol and tobacco. While acknowledging the usefulness of the information contained in the annual Statistical Abstract of the Board of Trade and in the Fiscal Blue-books, as a preliminary ground-work for inquiry, it is emphasized that only personal investigation among consumers and traders can supply those corrections which statistics, based "on general and universal figures," necessarily demand. The writer's conclusions in regard to food taxation—sugar, cocoa and coffee, tea and dried fruits—are summarized as follows, viz.:—

(i.) It is regressive. The smaller incomes pay a disproportionately large percentage.

(ii.) Assuming a normal consumption, it amounts to 1.25*d.* per head per week, or, in the case of the average family, to 6*d.* a week.

(iii.) The higher family incomes among the working-classes reach this amount; if the family be small, or the number at work large, consumption frequently exceeds the normal.

(iv.) The consumption of taxed foods by middle-class families does not exceed that which obtains in many working-class families; very frequently it is lower. The superiority of their standard of life, in so far as food is concerned, depends rather on foods that are not taxed.

(v.) On the whole, the lower the family income the less the total contribution to the national expenditure, but the greater the percentage of income taken thereby. In other words, regression is practically continuous and universal, though its degree admits of exaggeration.

(vi.) The lower the standard of comfort, the larger the percentage

of food expenditure which is taxed. When the cheaper jam displaces the dearer butter or margarine, as also when the cheaper condensed milk displaces the dearer cow's milk, a portion of the family income which was before untaxed automatically becomes taxed.

(vii.) It is frequently true that when the contributions in food taxation are abnormally low, the contributions in respect of tobacco and alcohol are abnormally high.

The pamphlet is well illustrated by tables and diagrams.

The March issue of the *Quarterly Publications of the American Statistical Association* contains, in addition to the report of the Presidential Address on "The Need of Social Statistics as an aid to the Courts," delivered by Professor Walter F. Willeox at the annual meeting in December, 1912, a number of interesting articles. In a Paper on the function of the State in relation to Statistics of Municipal Finances, Mr. C. F. Gettemy, Director of the Massachusetts Bureau of Statistics, pleads for the stricter control by the State of municipal administration. Two Papers deal with the Census results. Mr. William S. Rossiter discusses possibilities in the practical application of federal census results, and Professor W. B. Bailey analyses some recent changes in the composition of the population of the United States. In the latter Paper it is pointed out that the Census of 1910 showed a greater proportion of males in Continental United States than any previous census since the United States became a nation. The number of states to show an excess of females is diminishing. This is attributed to the unprecedented immigration of the past decade together with the extremely large proportion of males in this immigration. The states with the smallest proportion of males show an increase in their population since 1900, while the states with the largest proportion of males have, in many cases, shown a decrease in their proportion. It is further pointed out that there has been a decrease since 1900 in the proportion of the population in the early age groups and an increase in the proportion in the upper age groups. The foreign-born whites furnish the only exception to this rule. This, it is stated, will probably be reflected in a higher average and median age of the population in 1910 than at any previous census. The proportion of married is higher in the age periods of early middle life and lower in the advanced ages. The conclusion is drawn that this indicates a tendency to earlier marriages, although the proportion of the unmarried in advanced ages is greater than in 1890 or 1900. Mention should be made of a short but suggestive contribution from Mr. C. A. Perry, of the Russell Sage Foundation, on "A Measure of the Manner of Living."

The retirement is announced of Dr. Jacques Bertillon, Chief of the Statistical Department of the City of Paris, who will be succeeded by Dr. Filassier. M. Bertillon, who has been an Honorary Fellow of the Royal Statistical Society since 1880, is a past President of the Statistical Society of Paris and a member of the International Statistical Institute. Another retirement is that of Regierungsrat Johann Strauss, who is resigning his office as Director of the Statistical Department of Serajevo, Bosnia, on the ground of ill-health. Herr Strauss, who is a member of the International Statistical Institute and has received the title of Hofrat on his retirement, is being succeeded by Dr. Max Birkovits.

The Tokio Statistical Society (Tokio Tokei Kiokwai) having recently suffered the loss by fire of its valuable library, which it had been thirty-three years in collecting, Mr. John Hyde, F.R.G.S., &c., formerly Chief of the Bureau of Statistics in the U.S. Department of Agriculture, has presented the Society with 3,000 volumes of statistical literature to form the nucleus of a new collection. In addition to official and other publications of fifty-two countries, the gift includes the transactions for a long series of years of the International Statistical Institute, the Royal Statistical Society, the American Statistical Association and other societies, besides a large number of miscellaneous books of reference. In accepting the gift the president of the Society, Baron Sakatani, announced that the Library would be given the name of the donor. The Society's address is 6, Yamashiro-cho, Kiobashi, Tokio, Japan.

The *Journal de la Société de Statistique de Paris* for June, 1913, contains, among other interesting material, an article by Mlle. Lydie de Pissargevsky entitled "Les statistiques concernant la femme dans les Etats de l'Union Nord-Américaine." Mlle. de Pissargevsky, by way of introduction, points out that the transactions of the Société de Statistique appear to contain not more than four articles directly concerning women, viz., *La femme à deux têtes* (1874); *Les femmes dans les chemins de fer* (1885); *Les professions des femmes en Angleterre* (1885); and *Le travail de nuit* (1904). Her present study, based on vol. 34 of the Annual Statistical Abstract of the United States, deals with the influence of the acquisition of political rights upon the women in the various states. Mlle. de Pissargevsky examines the figures available from various points of view (*e.g.*, divorce, labour, &c.), but reserves for a future contribution a closer study of the statistical data. The tables are very interesting, as will be seen from the most comprehensive of them, which is subjoined :—

	Number of officials and workmen.	Total wages.	Wage per worker.	Materials used in manufacture.	Total expendi- ture.	Value of production.	Excess of value of production over its cost.	Value of capital invested.	Per- centages.
1899.....	179,599	Million francs. 526	2,930	Million francs. 2,067	2,593	3,091	498	1,823	27
{ "Feminist" States	4,897,284	11,849	2,420	31,996	43,845	56,002	12,157	44,668	27
Other States ..									
Total	5,076,883	12,375	2,440	34,063	46,438	59,093	12,655	46,491	27
1904.....	239,740	850	3,540	2,749	3,599	4,373	774	3,190	24
{ "Feminist" States	5,748,199	15,616	2,720	41,197	56,813	72,112	15,299	62,470	24
Other States ..									
Total	5,987,939	16,466	2,750	43,946	60,412	76,485	16,073	65,660	24
1909.....	319,477	1,265	3,960	4,324	5,589	6,714	1,125	6,057	20
{ "Feminist" States	7,085,836	21,348	3,000	58,449	79,797	100,367	20,570	89,401	23
Other States ..									
Total	7,405,313	22,613	3,050	62,773	55,386	107,081	21,695	95,458	23
Increase per cent. of { "Feminist" States	178	241	135	209	216	217	226	333	- 2,6
1909 over 1899	44	181	124	183	182	178	167	200	- 1,5
Other States ..									
Taken together	46	184	125	185	184	181	171	205	- 1,5

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

Accountants' Magazine. June, 1913—Average in connection with marine insurance: *May (H. C.)*.

Bankers' Magazine. June, 1913—The Budget. Progress of banking in Great Britain and Ireland during 1912.—No. 5. Proportion of capital and reserve to deposits. Growth of leading savings banks: *Gibson (A. H.)*.

Journal of the Board of Agriculture. May, 1913—Composition of first-drawn and last-drawn milk: *Gilchrist (D. A.)*.

Journal of the Institute of Bankers. June, 1913—A critical examination of the incidence of the various forms of taxation, with especial reference to their influence upon industrial conditions: *Bull (A. J.)*.

Surveyors' Institution. Transactions. Session 1912-13—

Part 11—The valuation of flats: *Terry (F. T.)*.

Part 12—The Estates of the Colleges of Oxford and their management: *Price (L. L.)*. England's Acres: the story of land ownership: *Heal (J. G.)*.

UNITED STATES—

American Journal of Sociology. May, 1913—Eugenics, Euthenics, and Endemics: *Ward (Lester F.)*. Some implications of remedial and preventive legislation in the United States: *James (Eldon R.)*.

Annals of the American Academy of Political and Social Science. May, 1913—Contains a series of papers by different authors on:—County Government in the United States.

Journal of Political Economy. May, 1913—Time-study and task work: *Thompson (Stanford E.)*. Scientific management applied to commercial enterprises: *Walker (A.)*. The relationship of scientific management to labor: *Frey (John P.)*. Subsidized unemployment insurance: *Rubinow (I. M.)*. Commerce and industry in Spain during ancient and mediæval times: *Ardzrooni (Leon)*.

Quarterly Journal of Economics. May, 1913—The plan for a compensated dollar: *Taussig (F. W.)*. The tabular standard in Massachusetts history: *Fisher (Willard C.)*. The dominance of the National Union in American Labor Organisation: *Barnett (George E.)*. Tenancy in the Southern States: *Hibbard (Benjamin H.)*. The economic possibilities of conservation: *Gray (L. C.)*.

AUSTRIA—

Statistische Monatschrift. February-March, 1913—Die österreichische Auswanderungsstatistik: *Englisch (Dr. Karl R. v.)*. Die Ergebnisse der Viehzählung in Bosnien und der Herzegowina vom Jahre 1910: *Kuttelwascher (Dr. Hans)*.

FRANCE—

Bulletin de Statistique, Ministère des Finances. April, 1913—
La marine marchande. L'impôt sur les vélocipèdes en 1912.
Les produits de l'enregistrement, des domaines et du timbre
constatés et recouvrés en France, pendant l'exercice 1911.
Russie: Le projet de budget de 1913.

Journal des Economistes. May, 1913—La revision du tarif des
États-Unis: *Guyot (Yves)*. Protectionnisme et Tuberculose:
Nourion (Georges de). La crise du marché à terme et la
proposition de Monzie devant le Parlement: *Tchernoff (I.)*.

Journal de la Société de Statistique de Paris. May, 1913—Notes
statistiques sur le trafic continental franco-anglais en 1911:
Finay (J.). L'établissement et l'application des indices
nationaux Babson: *Babson (R. W.)*. Les habitations à bon
marché à Stockholm: *Guinchard (J.)*. Variété: Les Juifs
russes à Copenhague: *Trap (Cordt)*. Chronique des banques
et questions monétaires: *Roulleau (G.)*.

La Réforme Sociale—

May 1, 1913—Les Transformations agraires de la Russie:
Ardant (Gabriel). Le mouvement économique et social—
France, Belgique et Suisse: *Lepelletier (F.)*.

May 16, 1913—Le crédit agricole mutuel dans le midi de la
France: *Pasquet (M.)*. Les anciennes corporations de métiers
et la lutte contre la fraude dans le commerce et l'industrie:
Saint-Léon (Etienné Martin). Le mouvement économique et
social—Allemagne, Autriche-Hongrie: *Blondel (Georges)*.

June 1, 1913—Où en est la question de l'apprentissage?:
Hubert-Valleroux. Le développement économique de la région
lorraine: *Brocard (Lucien)*. Le mouvement économique et
social—France et Belgique: *Lepelletier (F.)*.

GERMANY—

Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft
(*Schmoller's*). Heft 2, 1913—Die nebenberuflichen Theater-
gesellschaften in Deutschland: *Alexander (Felix)*. Begründung
einer Betrieb-Wissenschaft: *Dieckrich (Rudolf)*. Die Festsetzung
einheitlicher Preise für Waren und Arbeitsleistungen: *Pudor*
(*Heinrich*). Das Submissionswesen und seine Reform: *Dohm*
(*Richard*). Die Grundzüge der britischen Nationalversicherung
von 1911: *Huth (G.)*. Fabriklehrlinge. Die rechtliche Rege-
lung ihrer Verhältnisse und deren wirtschaftliche Bedeutung:
Neukamp (Ernst). Ältere deutsche Kartelle: *Stieda (Wilhelm)*.
Die periodischen Druckschriften Deutschlands. Eine statis-
tische Untersuchung: *Stoklossa (Paul)*. Die wirtschaftliche
Lage Italiens in der Gegenwart: *Wilmersdoerffer (Ernst)*. Die
Schulze-Delitzschschen Genossenschaften in Polen ein Bollwerk
des Deutschtums: *Crüger (Hans)*. Der deutsche Zolltarif von
1902: *Holländer (Julius W.)*. Die Preussischen Staatseisen-
bahnen in ihren Ergebnissen und ihrer Finanzgebarung verglichen
mit der Pennsylvania Railroad und der London and North-
Western Railway: *Melchior (Reinhold)*. Russisch-Turkestan

GERMANY—*Contd.*

Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft—Contd.

und die Tendenzen der heutigen russischen Kolonialpolitik: *Hoetzsch* (Otto). Die ethischen Grundlagen der Nationalökonomie im Lichte der neuen "Tätigkeitsphilosophie": *Feuchtranger* (Ludwig).

Jahrbücher für Nationalökonomie und Statistik (Conrad's). May, 1913—Die Leistungsfähigkeit und andere Gesichtspunkte bei Bemessung von Geldleistungen: *Conrad* (Herbert). Die wirtschaftliche Gesetzgebung des Deutschen Reiches im Jahre 1912. Wirtschaftsverhältnisse und Wirtschaftsbeziehungen Indiens insbesondere zu England und Deutschland: *Krenzka*.

Zeitschrift für Socialwissenschaft. Heft 5, 1913—Der Ertragsgedanke: *Oswalt* (H.). Die Kollektiv-Pachtgenossenschaften der italienischen Landarbeiter: *Marchetti* (Lirio).

ITALY—

Giornale degli Economisti e Rivista di Statistica—

April, 1913—Il massimo di utilità per una collettività in sociologia: *Pareto* (V.). Le variazioni periodiche dello sconto: *Del Vecchio* (G.). Gli odierni aspetti dell'economia agraria: *Di Nola* (C.).

May, 1913—Considerazioni in difesa del ginoco d'azzardo legalmente disciplinato: *Martello* (T.). Il prodotto dei trasporti di merci sulle linee ferroviarie italiane: *Mortara* (G.). La rinnovazione dei trattati di commercio e le condizioni dell'agricoltura: *Carano-Donritto* (G.).

La Riforma Sociale—

April, 1913—Il capitale disponibile: *Johannis* (A. J. de). Inscritti e laureati e diplomati nelle università e negli istituti superiori italiani: *Ferraris* (Carlo F.). L'Istituto cotoniero italiano e la crisi: *Cabiati* (A.).

May, 1913—Le nuove "Provvidenze" del Ministero d'agricoltura per le società per azioni e cooperative e per la "tutela dei risparmi": *Geisser* (Alberto). Le conseguenze finanziarie del disegno di legge sulle scuole medie: *Contessa* (Carlo).

MONTHLY LIST OF ADDITIONS TO THE LIBRARY.

During the period that has elapsed since May 10, 1913, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

(a) Foreign Countries.

France—

Labour. Enquête sur le travail à domicile dans l'industrie de la fleur artificielle. 426 pp., 8vo. 1913. (The French Labour Department.)

Paris. Recueil de statistique municipale. 1912. No. 5. Statistique des Logements à Paris. (Nombre de pièces. Nombre d'habitants.) 55 pp., 8vo. 1912. (Dr. J. Bertillon.)

Hungary—

Census. Recensement général de la Population en 1910. Première partie. Données principales de la population par communes et par hameaux, colonies plus populeux. 8vo. Budapest, 1913. (The Central Statistical Office.)

Italy—

Emigration. Statistica della emigrazione italiana per l'estero negli anni 1910 e 1911. 8vo. 1913. (The Director-General of Statistics.)

Mexico—

Division Territorial de los Estados Unidos Mexicanos. Distrito Federal and Estado de Chiapas. 2 vols., la. 8vo. Mexico, 1913. (The Director-General of Statistics, Mexico.)

Russia—

Finland. Agriculture. Population agricole, ses rapports avec les autres groupes professionnels et sa composition sociale en 1901. 8vo. 1913. (The Central Statistical Bureau.)

Moscow. Census. Principaux résultats préliminaires du dénombrement du 6 Mars, 1912. Partie 1. Relevé de la population, logements et immeubles de Moseon et faubourgs. 38 pp., la. 8vo. 1913. (The Municipal Statistical Bureau.)

Spain—

Estadística del Suicidio en España. Sexenio 1906-11. La. 8vo. Madrid, 1913. (The Director-General of Institute of Geography and Statistics.)

Sweden—

Census. Folkräkningen den 31 December 1910. 11. Folkmanngdens Fordelning efter Kon, Alder, och Civilstand. 8vo. 1913. (The Central Statistical Bureau.)

— Folkmanngden inom Administrativa omraden den 31 December 1912. 8vo. Stockholm, 1913. (*Id.*)

Switzerland—

Bees. 5^e recensement fédéral des ruches d'abeilles exécuté le 21 Avril, 1911. 4to. 1913. (The Federal Statistical Bureau.)

Births, &c. Mariages, Naissances et Décès en Suisse de 1891 à 1900. Troisième Partie. Table de Mortalité 1889-1900. 4to. 1913. (*Id.*)

Bern (Kanton). Statistik der Milchwirtschaft im Kanton Bern pro 1911. 8vo. 1913. (*Id.*)

United States—

Connecticut. 32nd Report of State Board of Health for two years ended September 30, 1912. 8vo. 1913. (The Board.)

Massachusetts. Collective agreements between Employers and Labour Organisations, 1911. 8vo. 1912. (The Bureau of Statistics.)

(a) Foreign Countries—*Contd.***International—**

Publications of International Association for Labour Legislation. No. 8. Report of 7th General Meeting of Committee of International Association for Labour Legislation held at Zurich, 1912. Svo. London, 1912. (P. S. King and Son.)

(b) India and Colonies.

India, British—

Census of India, 1911. Vol. ii, The Andaman and Nicobar Islands. Part 1, Report. Part 2, Tables. 1 vol., fol. 1912. (The India Office.)
 — Vol. x, Central Provinces and Berar. Part 2, Tables. Fol. 1912. (*Id.*)
 — Vol. xiii, North-West Frontier Province. Part 1, Report. Part 2, Tables. 1 vol., fol. 1912. (*Id.*)
 — Vol. xiv, Punjab. Part I, Report. Fol. 1912. (*Id.*)
 — Vol. xvii, Central India Agency. Report and tables. Fol. 1913. (*Id.*)

Australia, Commonwealth of—

Labour and Industrial Branch. Report No. 2. Trade Unionism, Unemployment, Wages, Prices, and Cost of Living in Australia, 1891 to 1912. Svo. 1913. (The Bureau of Census and Statistics.)

Canada—

Saskatchewan. Progress of the Province of Saskatchewan. 113 pp., Svo. Regina, 1913. (The Department of Agriculture, Regina.)

New Zealand—

Census of New Zealand, 1911. Government Statistician's Report. 4to. 1913. (The Government Statistician.)

Trinidad—

Census of Trinidad and Tobago, 1911. 82 pp., fol. Trinidad, 1913. (The Colonial Secretary.)

Union of South Africa—

The Framework of Union. A comparison of some Union Constitutions. 8 + 207 + cxviii pp., Svo. Cape Town, 1908. (Messrs. Macmillan and Co.)
 The Government of South Africa. Vols. 1 and 2. 2 vols., Svo. [Cape Town], 1908. (*Id.*)

(c) United Kingdom and its several Divisions.

Scotland—

Public Health. Report on Sanitary Condition of the Lews. 14 pp., Svo. 1905. (The Local Government Board for Scotland.)
 — Report on Incidence of Ophthalmia Neonatorum in Scotland. 31 pp., Svo. 1912. (*Id.*)

(d) Authors, &c.

Ashley (Annie). Birmingham Studies in Social Economics. Edited by Professor W. J. Ashley. III. The Social Policy of Bismarck. A Critical Study, with Comparison of German and English Insurance Legislation. With Preface by Gustav Von Schmoller. ix + 95 pp., Svo. London, 1912. (Messrs. Longmans.)

Barker (D. A.). The Theory of Money. 141 pp., sm. Svo., Cambridge, 1913. (The Cambridge University Press.)

Chalmers (A. K.), M.D. The house as a contributory factor in the death-rate. 27 pp., Svo. London, 1913. (The Author.)

Chessa (Federico). La trasmissione ereditaria delle professioni. 136 pp., Svo. Torino, 1912. (*Id.*)

(d) **Authors, &c.—Contd.**

- Du Bois (Charles G.)*. Brief history of Telephone accounting. 66 pp., 8vo. New York, 1913. (The Author.)
- Edgeworth (F. Y.)*. A Method of representing Statistics by Analytical Geometry. 14 pp., 8vo. 1912. (*Id.*)
- Fisher (Irving)*. Capital and Income under the Income Tax Acts. 16 pp., 8vo. [1913.] (*Id.*)
- Kaufmann (Al.)*. Theorie und Methoden der Statistik. Ein Lehr- und Lesebuch für Studierende und Praktiker. xii + 540 pp., la 8vo. Tübingen, 1913. (J. C. B. Mohr.)
- Kolthammer (F. W.)*. The Ratan Tata Foundation (University of London). Memoranda on Problems of Poverty. No. 1. Some Notes on Incidence of Taxation on the Working-class Family. 16 pp., 4to. London, 1913. (Purchased.)
- Kurtén (Dr. O.)*. Ergänzungshefte zum Deutschen Statistischen Zentralblatt. Heft 3. Statistik des Selbstmordes im Königreich Sachsen. 145 pp., 8vo. 1913. (*Id.*)
- Leake (P. D.)*. Index to Depreciation and Wasting Assets and their treatment in Assessing Annual Profit and Loss. 28 pp., 8vo. London, 1913. (The Author.)
- Leener (G. de)*. La politique des transports en Belgique. (Instituts Solvay.) ix + 320 pp., 8vo. Brussels, 1913. (The Institute of Sociology, Brussels.)
- March (Lucien)*. Observation et stabilisation des prix. 59 pp., la 8vo. Paris, 1913. (The Author.)
- Minutilli (Gennaro)*. Nozioni di Scienza Attuariale. Matematica delle Assicurazioni. 87 Tavole. xiii + 329 pp., sm. 8vo. Milano, 1913. (Ulrico Hoepli.)
- Moride (Pierre)*. Les maisons à succursales multiples en France et à l'étranger. 235 pp., 8vo. Paris, 1913. (F. Alcan.)
- Payen (Edouard)*. La réglementation du travail réalisée ou projetée. Ses illusions, ses dangers. iv + 258 pp., sm. 8vo. Paris, 1913. (Felix Alcan.)
- Supino (Camillo)*. La Navigazione dal punto di vista economico. Terza edizione rifatta ed ampliata. Studi Giuridici e Politici. 450 pp., 8vo. Milano, 1913. (Ulrico Hoepli.)
- Tönnies (Dr. Ferdinand)*. Sammlung Göschen. Die Entwicklung der sozialen Frage. Zweite, durchgesehene Auflage. 160 pp., sm. 8vo. Berlin, 1913. (G. J. Goschen'sche Verlagsbuchhandlung.)
- Vogel (Dr. Walther)*. Die Grundlagen der Schifffahrtsstatistik. Ein kritischer Beitrag zur Wertung der Handelsflotte und des Seeverkehrs des Deutschen Reiches. x + 156 pp., 8vo. 1911. (Purchased.)
- Weber (Anatole)*. Essai sur le Problème de la Misère. 3^e edit. xi + 493 pp., 8vo. Paris, 1913. (The Author.)
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The TRADE of the BRITISH EMPIRE.

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[Read before the Royal Statistical Society, June 17, 1913,
the President, Professor F. Y. EDGEWORTH, M.A., F.B.A., in the Chair.]

AN attempt is made in this Paper to present the results of a preliminary survey of Imperial trade—its volume, growth, character and prospects. The subject is one in which, I venture to think, persons of every shade of political thought are keenly interested at the present moment; but it is as a contribution to a general scientific discussion, and by no means to provide fuel for the lighting of any controversial fires, that the materials bearing on the question have been carefully analysed and the results presented here.

I should like the present Paper to be regarded as opening up a series which will comprehend a complete statistical investigation of the leading features of our Imperial trade—the trade relations of the parts of the Empire to one another and of the Empire as a whole to foreign countries. In Papers to be subsequently prepared, and some of which I hope the editors will think suitable for publication in the *Journal*, I shall deal with the effects of tariffs, investment and emigration in relation to external as well as home trades, a detailed analysis of the character of the trade and the question of our Imperial food supplies.

It is a fairly obvious commonplace that before any quantity can be measured with precision it must be capable of precise definition. When dealing with trade statistics it is also desirable that the records of trade—the quantities upon which the statistical operations must be performed—should be clear, full, reliable, relating to the same time, referring to the same general matters, and collected on a similar basis. These requirements are not easily satisfied in any extensive statistical inquiry, much less easily when the foibles of

the many governments who independently and autonomously control the destinies of the hundreds of millions of people who inhabit the British Empire have to be taken into account. No statistician who has had occasion to use the statistics issued in the different parts of the Empire can fail to deplore the absence of any uniform plan in the preparation and publication of the returns. The trade years terminate at different dates; the classifications are totally different in all the principal parts of the Empire; bullion trade is in some cases inextricably interlocked in the returns of external trade; in other cases it is included, though separable; in still other cases it is not included at all; in some cases the duties, if any, are added to the import values, in others the imports are free of duty; in some cases the imports are declared values, in others they are official values. Thus we find reflected within the Empire every stage of development of statistical method adopted in relation to trade returns by the foreign countries of the world. This fact affords, perhaps, only one further illustration of the hackneyed truism that within the bounds of the British Empire are to be found countries with every stage of development of constitutional and administrative machinery, from the most primitive to the most highly developed.

Great as are the difficulties which these differences present to any student of comparative trade statistics, they are not incapable of rendering sufficiently satisfactory answers to certain specific questions. They introduce certain liabilities to error in the conclusions, which are not, however, of great importance if they are constantly before us. If we seek only the broad features of the various movements; if we content ourselves with approximations to the truth, we may tread the path with confidence.

“Trade” in the present paper refers only to the external trade—imports and exports—of each separate political unit of which the Empire is composed. Assuming that the object of any investigation such as that with which we are here concerned is to determine a measure of the dependence of each such political unit on countries external to itself for supplies of food, materials and other commodities, the term “imports” becomes, thereby, specially restricted to “imports for home consumption” or to “special imports.” This refinement introduced considerable complications in dealing with some of the returns, but was tackled and reasonably overcome by the method to be explained.

The measure of the total trade of the British Empire as given in the Statistical Abstract for the British Empire published annually by the Board of Trade, is the following:—

Total trade of the British Empire = trade of the British Empire with foreign countries (imports + exports).
 + trade of the United Kingdom with other parts of the Empire (imports + exports).
 + intercolonial trade (imports only).

It can be shown that this measure is defective, and is in the direction of exaggerating the relative importance of the foreign as compared with the Empire share of the total trade. In order to prove this, the following analysis should be sufficient :—

Let I = total imports into the Empire.
 E = total exports from the Empire.
 I_B = imports into } the United Kingdom.
 E_B = exports from }
 I_C = imports into } the Colonies, &c., other than intercolonial
 E_C = exports from } trade.
 I_{CC}, E_{CC} = intercolonial imports and exports respectively.
 I_{BF} = imports into } the United Kingdom { from } foreign coun-
 E_{BF} = exports from } { to } tries.
 I_{CF} = imports into } the Colonies, &c. { from } foreign countries.
 E_{CF} = exports from } { to }
 I_{BC} = imports into } the United Kingdom { from } the Colonies,
 E_{BC} = exports from } { to } &c.
 I_{CB} = imports into } the Colonies, &c. { from } the United King-
 E_{CB} = exports from } { to } dom.

Then

$$\begin{aligned}\text{Total trade} &= I + E. \\ &= \Sigma I_{BC} + \Sigma I_{BF} + \Sigma I_{CB} + \Sigma I_{CF} + \Sigma I_{CC} + E; \\ &= (\Sigma I_{BF} + \Sigma I_{CF} + \Sigma E_{BF} + \Sigma E_{CF}). \\ &\quad + (\Sigma I_{BC} + \Sigma I_{CB} + \Sigma E_{BC} + \Sigma E_{CB}). \\ &\quad + \Sigma I_{CC} + \Sigma E_{CC}.\end{aligned}$$

. If we assume for the present purpose that imports into the United Kingdom from the rest of the Empire are equal to the exports from the rest of the Empire to the United Kingdom, and similarly for other corresponding quantities, then—

$$\Sigma I_{BC} = \Sigma E_{CB}; \Sigma I_{CB} = \Sigma E_{BC}; \Sigma I_{CC} = \Sigma E_{CC}.$$

and the foregoing equation becomes—

$$\begin{aligned}\text{Total trade} &= (\Sigma I_{BF} + \Sigma I_{CF}) + (\Sigma E_{BF} + \Sigma E_{CF}) \\ &\quad + 2(\Sigma I_{BC} + \Sigma E_{BC}) + 2\Sigma I_{CC} \\ &= (\text{trade of Empire with foreign countries}) \\ &\quad + 2(\text{trade of the United Kingdom with the rest of the Empire}) \\ &\quad + 2(\text{intercolonial trade}).\end{aligned}$$

This formula differs from the method adopted by the Board of Trade in that it counts twice over, and thus gives double importance to trade between any two parts of the Empire as compared with the importance attached to trade between a part of the Empire and a foreign country, a conclusion flowing directly from the hypothesis that the proper measure of the external trade of any country is the sum of imports and exports. It is true that, in itself, such a measure

is, as Professor Cannan pointed out some years ago in his Presidential address to the Economics and Statistics Section of the British Association, logically quite indefensible and economically quite without meaning. It has a very general acceptance, however, and it is adopted by the Board of Trade. In the last analysis it rests on the assumption that imports measure the value of the needs of a country supplied from external sources, and exports the value of the external markets for the disposal of home produced or manufactured goods; and that these quantities can be simply aggregated to measure a quantity called external trade. The Board of Trade method of taking into account, for instance, the imports into the United Kingdom from the rest of the Empire and ignoring the corresponding exports from the rest of the Empire to Great Britain is, therefore, not consistent with its own definition. The effect of making full allowance for the mutuality of the two transactions is that the proportion of the aggregated external trade of the parts of the Empire contributed by the Empire is much larger than is represented by the Board of Trade method. For example, in 1910 the inter-Imperial share of the total trade of the British Empire is given in the Empire Statistical Abstract as 460*l.* millions out of a total of 1,777*l.* millions, or 26 per cent. According to the above formula the more accurate measure is 920*l.* millions out of a grand total of 2,237*l.* millions, or 41 per cent.

It will be shown later in this paper that the figures of the Board of Trade are subject to certain important corrections. It is convenient, therefore, to anticipate the results here and to apply the foregoing formula to determine the relative importance of the inter-Imperial and foreign trade of the Empire.

TABLE I.—*Trade of the British Empire (excluding bullion).*

[In million £.]

	1905.	1910.
1. Trade of the Empire with foreign countries—		
(a) Imports	500	612
(b) Exports	370	502
	— 870	— 1,114
2. Inter-Imperial trade—		
(a) Imports	261	344
(b) Exports	261	314
	— 522	— 688
Total	1,392	1,802
Ratio of Imperial to total trade } (per cent.)	37½	38
Ratio by Board of Trade formula ...	23	23½

The aggregate imports of the Empire—and this measures the aggregate of the dependence of the different parts of the Empire on external sources for its various supplies—amounted to 761*l.* millions in 1905 and 956*l.* millions in 1910. Of this total 34·3 per cent., or 261*l.* millions, represented inter-Imperial imports in 1905, and 344*l.* millions, or 36 per cent., in 1910. There is thus, at the outset, reason for believing that the Imperial share in supplying the Empire's needs has, in recent years, grown somewhat faster than the foreign share. On the other hand, the export trade, measuring the need of the Empire for external markets, in which its surplus supplies might be disposed of, have grown from 631*l.* millions in 1905 to 846*l.* millions in 1910. Out of this total the proportion despatched to within the Empire was the same in each year, viz., 41 per cent. The effect of combining imports and exports to produce the quantity defined as "total trade" is to show on the above basis that the inter-Imperial share has grown in five years from 37½ to 38 per cent. The conclusion from these figures is, therefore, that the inter-Imperial share of the trade of the Empire is very large, and is growing steadily and slightly more rapidly than the trade with foreign countries.

Before submitting any further tables it may be well to state the general objects of the investigation with which this paper deals. It is desired to find out and to measure the extent and growth of the trade of different parts of the British Empire with one another and with foreign countries. The large number of separate political units into which the British Empire is resolvable obviously compels some form of grouping of countries if the materials are to be kept within manageable dimensions. After casting about for some simple scheme of grouping, it appeared most convenient to group countries according to the continents in which they are situated. The British possessions in Europe, Asia, Africa, North America, South America and Oceania are here regarded as simple groups, and the trade between these groups and the corresponding groups of foreign countries has been examined. The various British possessions and foreign countries respectively included in these groups are set out in the Appendix, an examination of which will show that generally the classification followed is that adopted by the United States Department of Trade and Commerce in the trade returns of that country. The examination of the returns was one of considerable labour, and therefore it had to be confined to the narrowest possible limits. For this reason only two years' figures are given, relating respectively to 1905 and 1910. Earlier years would have been impracticable on the basis of the present paper, because it is only

since 1904 that the new system of returns adopted by our own Board of Trade has supplied materials enabling of an important correction to be applied, which will be fully explained in the sequel.

The materials being collected and tabulated in accordance with this scheme, answers are immediately possible to a number of interesting questions. Is there, for example, any tendency for British countries in any group to do a larger or more rapidly growing trade with one another than with foreign countries on the same continent? Does proximity count for much or anything? Does the Imperial connection influence trade? A provisional answer will be found to each of these questions, but a final answer is best postponed till the entire investigation outlined at the beginning of this paper has been completed.

By way of parenthesis, I may note here that I have adopted the following nomenclature as the most convenient for the purposes of the present paper. All the British possessions in Europe are termed "British Europe"; similarly, I refer to "British Asia," "British Africa," "British Oceania," &c. All the foreign countries in any continent are similarly referred to as "foreign Europe," "foreign Asia," and so on. This grouping and terminology are, on the whole, quite distinct. Some exceptions have, however, been necessary in the application of the principle. "Turkey-in-Europe" has been included in "foreign Asia."

It is the practice of the Board of Trade to add, indiscriminately, the "special" trade of one country to the "general" trade of another; statistical quantities in one country that include bullion with merchandise, to quantities in another that represent merchandise without bullion; quantities that include merchandise imported for the Government service to quantities that do not take account of this item. It seemed to me desirable to limit the connotation of trade, and as far as possible, therefore, the figures in this paper refer solely to the special trade in merchandise imported for private use or exported by private persons. The corrections introduced into the official returns are therefore of three kinds, and have been dealt with in the following manner:—

1. The "special" exports from the Empire to foreign countries do not consist solely of the exports recorded in the various returns as sent to foreign countries. These must be supplemented by those exports to the United Kingdom and other countries which are subsequently re-exported to foreign countries. It is premised that the necessity for this correction arises mainly with the returns of the United Kingdom. It is known that of the 104½ millions of re-exports from the United Kingdom in 1910, 50½ millions came from British Possessions. There is no published information

showing how this 50*l.* millions was re-distributed between the various regions of the world. In the absence of direct information on this subject estimates had to be made.

The method of making the estimates can be illustrated by means of an example. Take the case of rubber. The total re-exports of rubber in 1910 amounted to 14,900,000*l.* It was ascertained by an examination of the figures in vol. ii of the Board of Trade returns that of this total about 5,200,000*l.* (not necessarily a complete total) consisted of rubber of Empire origin, and came from British Asia (4,100,000*l.*) and British Africa (1,100,000*l.*) These quantities were then assumed to be ultimately redistributed among the various continental groups in the same proportion as the original total of 14,900,000*l.* for which, of course, the particulars are given in vol. i of the Trade Returns. All the principal items of Empire origin were distributed according to the same plan, with the result that it was found possible so to treat about 42,000,000*l.* of trade. The other 8,000,000*l.* consist partly of small residual quantities of the items dealt with in the previous total of 42,000,000*l.* and partly of other articles. It was considered a reasonable assumption, therefore, that this 8,000,000*l.* might be distributed exactly as the 42,000,000*l.*

The 50*l.* millions was in this way assigned to the various Continental groups. It was found that 49*l.* millions went to foreign countries, and the necessary corrections were made in the table of exports to foreign countries. The official returns show a total re-export to foreign countries of 92*l.* millions; hence 43*l.* millions of this total must have consisted of re-exports of foreign goods.

This 43*l.* millions are, for the present purposes, eliminated and ignored; they do not represent either the supply of materials to the Empire or the need of markets by the Empire for Imperial supplies. They represent goods which have no other connection with our subject than such as arises from the fact that they found a temporary resting-place in this country. I do not wish to minimise the importance of this trade which brings us profits, wages and shipping freights, but it is relevant to a different trade from that with which this paper is concerned.

Similarly as the returns show a re-export of 12*l.* millions to British Possessions, and the estimates referred to above indicated that the re-exports of Imperial merchandise amounted to 1*l.* million, it follows that the re-exports of foreign goods to British Possessions must have amounted to 11*l.* millions.

With regard to this item, it was decided to make no correction. In the first place it is comparatively small, representing only about 0.5 per cent. of the totals examined. In the second

place, and this appeared the more important consideration, a large part of these goods found their way ultimately to countries, where, for various reasons, a declaration of origin is demanded or the real origin of the goods is closely scanned. The effect, therefore, is that such goods tend, in general, to be correctly returned as from the country of real origin instead of from the United Kingdom.

2. Other corrections were necessary on account of imports and exports of treasure and imports for Government Service. In general these corrections were possible by simple elimination from the returns. In some cases, however, the information as to countries of origin or destination was insufficient or not available. Where this was the case an examination of the returns of other countries, usually the United Kingdom, enabled some approximate estimate to be made of the total deduction on this account.

3. The differences of dates and of the basis on which the returns are collected and published introduce another theoretical source of error. The British and the majority of the other returns, relate to the calendar year; the Indian and Canadian returns to the year ending March 31; other returns, to years ending June 30. After reflection, it was decided that no harm could be done by following the example of the Board of Trade, and treating them all as if the returns related to exactly the same periods. This applies also to the differences of method of fixing the values. In both cases no appreciable error will be introduced so long as the system is the same in the two years. Having corrected for the large error in the United Kingdom returns, the residual error in connection with other returns is likely to be small in the aggregate, and negligible when the resulting figures are to be employed only for purposes of comparison with others liable to the same differences.

Extent of the trade of the Empire.

The first table, embodying the foregoing corrections, shows the actual value of the imports into the different continental groups of British countries from the corresponding groups of foreign countries.

Table II gives a measure of the needs of the British Empire supplied by foreign countries. In 1910 this amounted to a total value of 612*l.* millions, of which, however, no less than 454*l.* millions was accounted for by the United Kingdom alone. The table shows, moreover, that the United Kingdom, so far as it depended on foreign supplies, drew the larger part of it, as might have been expected, from European countries, and about one-fourth from the United States and Mexico. In British Africa, and

TABLE II.—*Imports into Continental groups of British countries from Continental groups of foreign countries.*

[In million £.]

	Europe.		Asia.		Africa.		North America.		South America.		Oceania.		Not specified.		Total.	
	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.
British countries in—																
Europe—																
United Kingdom.....	222.0	254.0	10.0	16.5	16.6	21.1	109.8	112.9	35.8	48.0	1.4	1.3	0.07	0.04	395.7	453.9
Other	0.8	1.1	0.3	0.25	0.16	0.19	0.06	0.06	—	0.01	—	—	—	—	1.3	1.6
Asia	13.5	15.8	14.7	24.7	0.3	0.3	1.9	2.9	0.01	0.01	0.13	0.17	0.05	0.18	30.6	44.0
Africa	6.2	10.0	0.3	0.3	0.6	0.7	3.0	3.3	1.5	0.8	0.01	0	0.12	0.02	11.8	15.1
North America	5.2	7.6	0.7	1.1	0.01	0.01	38.5	61.9	0.8	1.1	0.01	0.01	0	0.03	45.2	71.7
South America	0.03	0.13	—	0.01	0.01	0.02	0.5	0.4	0.01	0.02	—	—	—	0	0.5	0.6
Oceania	6.8	12.6	1.3	2.2	0.01	0.02	6.5	9.2	0.08	0.25	0.24	0.4	0.05	0.04	14.9	24.7
	354.5	501.2	27.3	45.1	17.7	22.3	160.3	190.7	38.2	50.2	1.8	1.9	.3	.3	500.0	611.6

Australasia it was also the case that European foreign countries were the principal foreign sources from which imports were drawn. In the two American continents the United States is predominant, while in British Asia foreign countries in that continent are predominant.

How far contiguity accounts for the volume of trade may to some extent be investigated by means of the above table. It is noticeable that British Europe, Asia and North America respectively derived the largest share of their foreign imports from countries situated in the same continent. Thus, the foreign imports into British Europe amounted to 455½*l.* millions, of which 255*l.* millions came from European countries. Similarly, the foreign imports into British Asia amounted to 44*l.* millions, of which 24·7 millions, or over one-half, came from Asiatic countries. In North America the total was 71·7*l.* millions, of which 61·9*l.* millions came from foreign countries in the same continent. Only a small proportion of the imports into our African possessions came from the non-British parts of Africa, while in the case of Oceania it is clear that the absence of any important non-British communities accounts sufficiently for the smallness of this figure.

In the second part of the foregoing table corresponding figures are given relating to 1905, which, in conjunction with the previous figures, make it possible to measure the recent growth in the Empire's foreign trade. In 1905 the total of foreign imports into the Empire amounted to exactly 500*l.* millions, so that the average annual increase in the following five years has been 22*l.* millions, or 4½ per cent. In what regions the increase has been greater or less than this average is exhibited in later tables. Here we may draw preliminary attention to the fact that the imports into British Europe from foreign European countries rose in the period in question by 14 per cent. The total imports into the United Kingdom from all non-European foreign countries rose by 15 per cent. But the total imports into the rest of the Empire from all foreign countries has grown by no less than 50 per cent. This proves that large as has been the rate of growth of British imports from foreign countries in recent years, the rate of growth in other parts of the Empire has been very considerably larger.

The relative distribution of the foreign trade of the Empire between continental groups of countries is shown in the next table.

TABLE III.—*Percentage distribution of imports into Continental groups of British countries from Continental groups of foreign countries.*

	Europe.		Asia.		Africa.		North America.		South America.		Oceania.		Not specified.		Total.	
	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.
British countries in—																
Europe—																
United Kingdom	56.1	56.0	2.5	3.6	4.2	4.6	27.8	24.9	9.0	10.6	0.35	0.30	0.02	0.01	100.0	100.0
Other	62.3	68.6	21.6	15.1	11.8	11.8	4.3	3.6	—	0.7	—	—	—	0.12	100.0	100.0
Asia	44.3	35.8	48.0	56.1	1.0	0.67	6.1	6.6	0.04	0.03	0.42	0.40	0.15	0.40	100.0	100.0
Africa	52.9	66.1	2.5	2.0	5.2	4.4	25.7	22.2	12.7	5.2	0.06	0.03	1.03	0.13	100.0	100.0
North America	11.4	10.6	1.6	1.5	0.03	0.01	85.2	86.3	1.8	1.5	0.01	0.02	0.01	0.05	100.0	100.0
South America	5.6	22.0	—	0.85	2.1	2.5	89.6	71.7	2.7	2.7	—	—	—	0.17	100.0	100.0
Oceania	45.4	50.9	8.5	8.9	0.05	0.06	43.6	37.3	0.54	0.99	1.6	1.7	0.32	0.16	100.0	100.0
Total	50.4	49.2	5.5	7.4	3.5	3.6	32.1	31.2	7.6	8.2	0.4	0.3	0.06	0.05	100.0	100.0

This table emphasises certain observations made above that there is a tendency for the larger part of British trade with foreign countries to be done with foreign countries on the same continent, and the percentage tends to diminish appreciably as the distance grows.

A more noticeable deduction from the foregoing table is the tendency for the relative distribution of imports to be stereotyped in the two periods. The most important differences are the changes in the imports into British South America, which, however, can be ignored in view of the smallness of the totals concerned. An interesting change is also apparent in our African possessions, into which the imports from European countries have grown, and thus replaced a diminution of imports from North and South America. The substitution of Japan for Europe in the imports of our Asiatic possessions is also apparent in the figures for Asia.

The next table shows the relative growth of imports into the Empire from foreign countries. In order to avoid a suggestion that equal importance was being attached to the different aggregates without regard to the volume of the trade concerned, differentiations of type are employed, the heaviest type being employed where the trade concerned amounted either in 1905 or 1910 to over 100 millions, and italic type where it amounted to from 10 millions to 100 millions.

TABLE IV.—*Statement showing percentage increase (+) or decrease (—), between 1905 and 1910, of imports into British groups from corresponding foreign groups.*

	Europe.	Asia.	Africa.	North America.	South America.	Oceania.	Total.
British possessions in Europe—							
United Kingdom	+ 14.4	+ 63.8	+ 27.0	+ 2.9	+ 34.0	— 1.9	+ 14.7
Other	+ 35.4	— 13.7	+ 23.2	+ 3.5	..	..	+ 23.0
Asia	+ 16.4	+ 68.3	— 7.5	+ 54.3	Nil	+ 34.9	+ 43.8
Africa	+ 60.3	+ 5.5	+ 8.2	+ 10.7	— 47.6	— 42.9	+ 28.2
North America	+ 47.9	+ 51.6	— 16.7	+ 60.8	+ 35.1	+ 160.0	+ 58.8
South America	+ 348.3	..	+ 36.4	— 9.2	+ 14.3	..	+ 13.4
Oceania	+ 85.6	+ 72.9	+ 100.0	+ 41.4	+ 206.3	+ 79.1	+ 65.5
	18.5	65.2	26.0	19.0	31.4	5.6	22.3

Examination of this table shows that there is no apparent tendency for trade with countries in the same continent to grow more rapidly than with other countries. The most striking fact that emerges is that in the largest trading groups the greatest increases have taken place in the imports into the United Kingdom from Asiatic countries, and into British Asia from the same countries. In fact, the increase

by 66 per cent. in the imports into the Empire from foreign Asia is one of the most striking conclusions of the present inquiry. It is due, mainly, to the rapidly increasing activities of Japan. Similarly large rates of increase are exhibited in the imports from European countries into British Africa, North America and Australasia, as well as in those from foreign into British North America. It is noticeable also from the foregoing table that the foreign imports into the different parts of the Empire are growing far more rapidly than into the United Kingdom. The imports into British Asia increased by 44 per cent., into British Africa by 28 per cent., British North America by 59 per cent., and British Australasia by $65\frac{1}{2}$ per cent., whereas it was less than 15 per cent. in the case of the United Kingdom. For a period so short as five years these increases cannot be regarded as other than phenomenal.

Hitherto our references have been restricted to the imports into the Empire from foreign countries. The story is incomplete without the complementary statement of the inter-Imperial trade, *i.e.*, the trade into any part of the Empire from the rest of the Empire. This information is provided in Table V.

The trade comprised within the description inter-Imperial is, as this table shows, very large and growing, amounting in 1905 to 261*l.* millions, and in 1910 to 344*l.* millions, an increase of nearly one-third in five years. Out of the total importation of 344*l.* millions, rather more than one-third, or 121*l.* millions, is accounted for by imports into the United Kingdom and rather less than one-half, or 162*l.* millions, by imports from the United Kingdom. The inter-Colonial trade in which the United Kingdom has no direct concern, obtained by erasing the columns and rows referring to Europe in the above table, amounted therefore to 49*l.* millions in 1905 and 63*l.* millions in 1910. Having regard to the enormous populations represented by this inter-Colonial trade, it is impossible not to regard these totals as comparatively small. It is partly due, no doubt, to the fact that the requirements of these countries consist to a large extent of manufactures and development machinery such as can be obtained only in countries where manufactures have reached an advanced stage. In the British Empire, these conditions are only satisfied at present by the United Kingdom.

In Table VI I have brought together the figures relating to imports to show how the import trade of the Empire is distributed between British and foreign countries. The proportion of the trade of each British group of countries with foreign countries grouped under Continents is given for the years 1905 and 1910, and we are able to examine, therefore, the relative importance and the dynamic tendencies of foreign participation in the trade of the Empire.

TABLE V.—*Inter-Imperial trade (imports).*

[In million £.]

	Europe.		Asia.		Africa.		North America.		South America.		Oceania.		Not specified.		Total.	
	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.
Imports into British Possessions in—																
Europe—																
United Kingdom.....	1.9	1.8	31.7	41.1	3.4	7.0	25.4	27.2	0.6	1.0	28.6	42.4	0.15	0.13	91.6	120.7
Other.....	0.4	1.1	0	0.01	—	—	—	0	—	—	0.03	0.03	—	0	0.4	1.1
Asia	51.0	60.4	28.5	35.1	1.6	2.3	0	0	—	—	1.0	1.6	0.3	0.6	82.4	99.9
Africa	22.2	30.0	2.4	2.7	0.7	0.7	0.4	0.7	—	—	2.2	1.8	0.04	0.13	28.0	36.1
North America.....	17.7	26.7	0.9	1.2	0.04	0.15	3.1	3.7	0.5	0.8	0.2	0.4	0.01	0	22.5	32.9
South America.....	0.9	0.9	0.06	0.07	—	—	0.14	0.16	—	—	—	0	—	—	1.1	1.1
Oceania.....	28.0	40.7	2.8	4.6	0.09	0.22	0.5	1.2	—	0.01	3.5	5.1	0.11	0.15	35.0	51.9
	122.1	161.6	66.4	84.8	5.8	10.4	29.5	33.0	1.1	1.8	35.5	51.3	0.6	1.0	261.0	343.7

TABLE VI.—*Statement of relative proportions of imports into groups of British countries from foreign countries and other groups of British Possessions on the same continent, respectively.*

(F.C. = Foreign countries, B.P. = British Possessions.)

British countries in —	Europe.		Asia.		Africa.		North America.		South America.		Oceania.		Total.	
	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.
Europe { United Kingdom Other	99.2	99.3	24.1	28.6	83.2	75.2	81.2	80.6	98.4	97.9	4.6	3.1	81.2	79.0
	0.8	0.7	75.9	71.4	16.8	24.8	18.8	19.4	1.6	2.1	95.4	96.9	18.8	21.0
Asia { F.C. B.P.	69.0	51.0	99.3	94.6	100.0	100.0	100.0	98.3	—	100.0	—	—	76.9	59.2
	31.0	49.0	0.7	5.4	—	—	—	1.7	—	—	100.0	100.0	23.1	40.8
Africa { F.C. B.P.	21.0	20.7	33.9	41.3	16.8	11.5	99.9	99.9	100.0	100.0	11.9	10	27.1	30.6
	79.0	79.3	66.1	58.7	83.2	88.5	0.1	0.1	—	—	88.1	90	72.9	69.4
North America { F.C. B.P.	21.9	24.9	10.7	10.0	46.6	47.0	87.7	83.3	100.0	100.0	0.3	0.2	29.6	29.5
	78.1	75.1	89.3	90.0	53.4	53.0	12.3	16.7	—	—	99.7	99.8	70.4	70.5
South America { F.C. B.P.	22.6	22.2	44.6	47.6	25.0	6.5	92.5	94.4	59.9	57.8	3.0	3.4	66.8	68.6
	77.4	77.8	55.4	52.4	75.0	93.5	7.5	5.6	40.1	42.2	97.0	96.6	33.2	31.4
Oceania { F.C. B.P.	3.1	13.2	—	6.8	100.0	100.0	76.6	72.4	100.0	100.0	—	—	32.2	35.2
	96.9	86.8	100.0	93.2	—	—	23.4	27.6	—	—	—	100.0	67.8	64.8
Total	19.5	23.6	31.5	32.6	7.9	6.8	92.6	88.7	100.0	98.0	6.3	7.6	29.9	32.2
	80.5	76.4	68.5	67.4	92.1	93.2	7.4	11.3	—	2.0	93.7	92.4	70.1	67.8
Total	67.6	65.1	29.1	34.7	75.3	68.2	84.5	85.2	97.2	96.5	4.8	3.6	65.7	64.0
	32.4	34.9	70.9	65.3	24.7	31.8	15.5	14.8	2.8	3.5	95.2	96.4	34.3	36.0

This table should be read as in the following example. In 1905, 21 per cent. of the imports into British Asia from Europe came from foreign Europe and 79 per cent. from British Europe; in 1910 the proportions were 20·7 and 79·3 per cent. respectively.

An examination of the table shows that in the majority of the groups in which the trade of the Empire is here analysed the imports from British countries are relatively larger than from foreign countries. Moreover, the growing imperialisation of British trade is illustrated by the fact that in 20 of these groups the British percentage has increased, while in 14 cases it has declined or the foreign share has increased. In the case of the United Kingdom, it is practically only in the case of imports from Asia that the foreign share has grown, though the British share is still preponderant. British Asia draws a larger proportion of imports from British than foreign countries, though in the case of imports from America, foreign countries supply the whole of the external requirements coming from that part of the world. Only in the case of imports from Asia do the foreign imports into British Asia show any tendency to increase, and this is, of course, due entirely to the growing importance of Japan as a trading nation.

We next turn to the other aspect of the Empire's trade—the supply of Imperial produce or manufactures to foreign lands. The figures showing the extent and growth of this trade in recent years are set out in Table VII.

One of the special merits claimed for this table is that it is the first attempt, so far as the writer is aware, to measure the total supply of Imperial produce and manufactures to foreign countries. The ordinary figures published by the Board of Trade make no allowance for the re-exports from the United Kingdom of British (*i.e.*, coming from parts of the Empire outside the United Kingdom) as distinct from foreign produce. These are all massed together into a single group of foreign and colonial merchandise. For our present purpose we are obviously not concerned with goods, foreign in origin, coming to the United Kingdom and afterwards exported to foreign countries. At the same time we are decidedly concerned to know, in any measurement of the dependence of foreign nations on the British Empire for their supplies of goods, how much of the re-exports to foreign countries consist of British produce. The method explained in the earlier portion of this paper enables this correction to be made with approximate accuracy, and at the same time to apportion these exports approximately among the regions from which they were originally derived.

The table itself shows that the exports from the Empire to foreign countries now exceed 500/. millions, representing an increase

TABLE VII.—*Exports of produce and manufactures of the Empire from different Continental groups of British countries to Continental groups of foreign countries.*

[In million £.]

	Europe.		Asia.		Africa.		North America.		South America.		Oceania.		Not specified.		Total.	
	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.
British possessions in—																
Europe—																
United Kingdom	106.7	143.7	34.4	33.8	14.0	18.4	29.3	37.8	29.0	48.1	2.2	1.3	0.01	0	215.6	283.1
Other	0.13	0.3	0.041	0.07	0.3	0.17	0	0	—	0.01	—	—	—	0.01	0.4	0.5
Asia	41.6	63.2	21.7	28.1	1.8	2.1	20.6	24.9	3.3	2.5	0.4	0.4	0.02	0.5	88.4	121.8
Africa	6.8	13.6	0.02	0.02	0.8	0.7	1.8	3.9	0	0	—	—	0.02	0.01	9.5	18.2
North America	3.4	4.2	0.3	0.25	0.02	0.05	20.6	25.3	1.0	1.4	0	0.04	0.03	0.04	25.3	31.4
South America	0.1	0.03	—	—	0	—	0.3	0.3	0.01	0.02	—	—	—	0.08	0.4	0.4
Oceania	21.9	36.3	1.1	1.1	0.2	1.2	6.3	6.5	0.6	0.8	0.8	0.8	—	—	30.9	46.7
	180.6	261.3	57.6	63.3	17.1	22.6	78.9	98.7	33.9	52.8	3.4	2.5	.1	.6	370.5	502.1

of 131½*l.* millions, or over one-third in five years. The United Kingdom alone accounted for 283*l.* millions of this trade, or 56 per cent., in 1910, as compared with 216*l.* millions, or 58 per cent., in 1905. Thus the parts of the Empire outside the United Kingdom show a somewhat more rapid increase in exports to foreign countries than the United Kingdom, the former having increased by 41 per cent. and the latter by 31 per cent. About one-half of the United Kingdom exports went to foreign European countries both in 1905 and 1910. As far as the rest of the Empire is concerned, there has been a decided development in the European trade from about 48 per cent. to 54 per cent.

Next to the European trade the exports to North American countries (*i.e.*, mainly the United States) are the most important. The amount exported from British Europe amounted to 38*l.* millions, and the remainder was made up of nearly equal values of exports from British Asia and British North America. In each case the value of the exports was about 20½*l.* millions in 1905 and 25*l.* millions in 1910. The only other items of importance are the exports from British Asia to foreign Asiatic countries, mainly Japan, and from British Australasia to Europe. Thus, apart from the United Kingdom, the only export trades from the Empire to foreign countries of any substantial importance are accounted for by Canada, Australasia, and India.

In the next table the rate of growth in each territorial compartment of trade is shown, the same scheme of typographical differentiation according to the volume of trade as before being adopted. Taking first the compartments in which a volume of trade exceeding 10*l.* millions per annum existed, here indicated by black type, the largest rate of increase was shown by the exports from British Africa to the European Continent. Next to this came the exports from the United Kingdom to South America and from British Australasia to the European Continent. A large growth was also shown in the exports from British Asia to Europe. It is thus mainly with Europe that the Empire's foreign export trade has expanded most rapidly. The whole of the figures are set out in the following table:—

TABLE VIII. — *Statement showing percentage increase (+) or decrease (—) between 1905 and 1910 of exports from British groups to foreign groups.*

	Europe.	Asia.	Africa.	North America.	South America.	Oceania.	Total.
British possessions in—							
Europe—							
United Kingdom	+ 34·6	— 1·7	+ 31·7	+ 28·8	+ 66·1	— 39·2	+ 31·3
Other	+ 131·2	+ 68·3	— 38·1	— 66·7	....	....	+ 22·9
Asia	+ 51·9	+ 29·5	+ 16·7	+ 20·9	+ 8·7	+ 9·1	+ 37·8
Africa	+ 100·0	+ 15·0	— 17·9	+ 116·7	....	....	+ 91·6
North America	+ 23·5	— 11·6	+ 211·8	+ 22·8	+ 35·4	[+ 1950]	+ 24·1
South America	— 69·0	....	....	— 15·8	+ 77·8	....	— 5·0
Oceania	+ 65·8	+ 1·6	+ 411·3	+ 3·2	+ 37·6	— 0·5	+ 51·1
Total	+ 44·7	+ 9·9	+ 32·2	+ 25·1	+ 60·5	— 26·5	+ 35·5

Apart from the question of growth, it is of interest to examine the relative distribution of the trade of different parts of the Empire with various foreign groups of countries. The result of this examination is shown in Table IX.

The figures in this table manifest a tendency, except in the case of North and South America, for the proportions of trade with European foreign countries to be the largest and to be the most rapidly increasing, and further, for the proportions in other parts of the world, to remain stationary or to change slowly. The only considerable changes are the United Kingdom increase in the exports to South America, and the increased proportion of exports from British Asia, Africa and Australasia respectively to foreign countries in Europe. At the same time there were reductions in the proportions of exports from British Asia to adjacent foreign countries and to North America, and from British Africa to foreign countries in the same regions. It is a somewhat remarkable conclusion, requiring, it may be, further examination before affording a safe basis for generalisation, that the trade with adjacent countries appears the least progressive, and that the most progressive trade is that with foreign countries in Europe. A little reflection would, however, supply a ready explanation for this superficial paradox. All the British countries outside the United Kingdom export only food—human and animal—and materials for manufactures. Practically all the manufacturing countries and nearly all the food-importing countries are in Europe, while British possessions are, in general, so situated that they are adjacent to countries which produce in general similar articles and have no need for reciprocal trade exchanges. In most of the cases referred to of diminished relative exports, there has been no absolute decline in the trade; there has been merely an increase less rapid in the branches of trade referred to than in the other principal portions.

TABLE IX.—*Percentage distribution of exports from Continental groups of British countries to Continental groups of foreign countries.*

	Europe.		Asia.		Africa.		North America.		South America.		Oceania.		Not specified.		Total.	
	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.
British countries in—																
Europe—																
United Kingdom	49.5	50.8	16.0	11.9	6.5	6.5	13.6	13.3	13.4	17.0	1.0	0.48	0.003	—	100.0	100.0
Other	28.6	53.8	9.4	12.8	61.3	30.9	0.7	0.2	—	0.9	—	—	—	1.3	100.0	100.0
Asia	47.1	51.9	24.6	23.1	2.0	1.7	23.3	20.4	2.6	2.1	0.42	0.34	0.02	0.4	100.0	100.0
Africa	71.9	74.7	0.2	0.13	8.6	3.7	19.0	21.4	0.01	—	—	—	0.17	0.06	100.0	100.0
North America	13.4	13.4	1.1	0.8	0.07	0.17	81.4	80.9	4.1	4.5	0.008	0.13	0.10	0.11	100.0	100.0
South America	[25]	8.2	—	—	[0.5]	—	[75]	67.1	[2]	4.2	—	—	—	20.5	100.0	100.0
Oceania	70.9	77.7	3.6	2.4	0.78	2.6	20.4	13.9	1.8	1.7	2.7	1.8	—	—	100.0	100.0
Total	48.7	52.0	15.5	12.6	4.6	4.5	21.5	19.7	8.9	10.5	0.9	0.5	0.03	0.1	100.0	100.0

Table X gives the exports from different parts of the Empire. In truth, the table is merely a repetition of one already given and relating to imports. Advantage has been taken of the fact that every inter-Imperial import is also an inter-Imperial export to avoid the laborious necessity of going twice through the returns where once would suffice. A little reflection will show that our new table of inter-Imperial exports will be derived from the former table of inter-Imperial imports by, as it were, turning each column through a right angle round the common axis. Thus the columns headed Asia should be rotated clockwise round the figures 28.5 for 1905 and 35.1 for 1910, and so on for the other columns.

There is one merit in thus deriving the foregoing export table from the corresponding import table that is of some importance. In the case of countries in which duties are levied on imports the import returns are in general much more likely to be accurate. Further, where the duties vary with the countries of origin, as is now the case in all the overseas dominions and in some of the West Indies, the returns are likely to represent with considerable accuracy the country of export, since a declaration of origin will in general be required to accompany any payment of duties. Finally, there is the further advantage that by regarding, as it were, imports and exports as different aspects of the same phenomenon, they will be represented as simultaneous manifestations of the same transactions; we thus eliminate the error arising from the fact that time has elapsed between the moment of export and the moment of import, and that, therefore, the transactions represented by, say, imports into Canada from the United Kingdom appear some time later in the returns of Canada than the corresponding exports from the United Kingdom to Canada. Against these advantages we must obviously set the serious disadvantage of having exaggerated the value of the exports, since the imports in general include the value added to the original exports by freight and insurance costs. Since, however, we are mainly concerned with relative volumes and tendencies of trade, this last consideration is of minor importance and may be ignored in the face of the substantial advantages of following the course explained.

We may now show the result of combining the tables relating to the export trade of the Empire by indicating, as in Table XI, the distribution of the exports from each part of the Empire to British and foreign destinations respectively.

The first interesting conclusion from this table taken in conjunction with Table VI is that, on the whole, the Empire depends less on foreign countries for the exports of Empire products and manufactures than for imports. This is not necessarily fully explained by

TABLE X.—*Inter-Imperial exports.*

	Europe.		Asia.		Africa.		North America.		South America.		Oceania.		Not specified.		Total.	
	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.
British countries in —																
Europe —																
United Kingdom	0.4	1.1	51.0	60.4	22.2	30.0	17.7	26.7	0.9	0.9	28.0	40.7	—	—	120.2	159.8
Other	1.9	1.8	0.005	0.01	—	0	—	0	—	—	—	—	—	—	1.9	1.8
Asia	31.7	41.1	28.5	35.1	2.4	2.7	0.9	1.2	0.06	0.07	2.8	4.6	—	—	65.4	81.7
Africa	3.1	7.0	1.6	2.3	0.7	0.7	0.04	0.1	—	—	0.09	0.22	—	—	5.8	10.3
North America	25.4	27.2	0	0	0.4	0.7	3.1	3.7	0.14	0.16	0.5	1.2	—	—	29.6	32.9
South America	0.6	1.02	—	—	—	—	0.5	0.8	—	—	—	0.01	—	—	1.1	1.8
Oceania	28.6	42.5	1.0	1.6	2.2	1.8	0.16	0.4	—	0	3.5	5.1	—	—	35.4	51.3
Continents not specified	0.15	0.13	0.3	0.6	0.04	0.13	0.01	0	—	—	0.11	0.15	—	—	0.6	1.1
Total	92.2	121.9	82.4	100.0	27.9	36.0	22.4	32.9	1.1	1.1	35.0	52.0	—	—	261.0	343.7

TABLE XI.—*Statement of relative proportions of exports from groups of British countries to Imperial and foreign countries respectively.*

British countries in—	Europe.		Asia.		Africa.		North America.		South America.		Oceania.		Not specified.		Total.	
	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.	1905.	1910.
Europe—																
United Kingdom { F.C. B.P.	99.7 0.3	99.3 0.7	40.3 59.7	35.9 64.1	38.6 61.4	38.0 62.0	62.4 37.6	58.6 41.4	97.0 3.0	98.3 1.7	7.3 92.7	3.2 96.8	— —	— —	64.2 35.8	63.9 33.1
Other { F.C. B.P.	6.3 93.7	13.7 86.3	89.1 10.9	83.1 16.9	100.0 —	97.6 2.4	100.0 —	[50] [50]	— —	100.0 —	— —	— —	— —	— —	19.0 81.0	22.6 77.4
Asia { F.C. B.P.	56.8 43.2	60.6 39.4	43.2 56.8	44.5 55.5	42.9 57.1	43.8 56.3	95.9 4.1	95.5 4.5	97.5 2.5	97.3 2.7	11.9 88.1	8.2 91.8	— —	— —	57.1 42.9	59.0 41.0
Africa { F.C. B.P.	66.7 33.3	66.0 34.0	1.3 98.7	1.0 99.0	53.8 46.2	47.3 52.7	98.0 2.0	96.4 3.6	100.0 —	— —	— 100.0	— 100.0	— —	— —	62.1 37.9	63.8 36.2
North America { F.C. B.P.	11.8 88.2	13.4 86.6	99.6 0.4	98.8 1.2	3.8 96.2	7.3 92.7	86.9 13.1	87.2 12.8	87.9 12.1	89.7 10.3	0.4 99.6	3.4 96.6	— —	— —	46.1 53.9	48.8 51.2
South America { F.C. B.P.	[14] [86]	3.0 97.0	— —	— —	100.0 —	— —	35.8 64.2	24.1 75.9	100.0 —	100.0 —	— 100.0	— 100.0	— —	— —	[26] [74]	17.3 82.7
Oceania { F.C. B.P.	43.4 56.6	46.1 53.9	53.6 46.4	40.7 59.3	9.9 90.1	40.9 59.1	97.5 2.5	94.8 5.2	100.0 —	99.9 0.1	19.6 80.4	14.1 85.9	— —	— —	46.6 53.4	47.7 52.3
Total { F.C. B.P.	66.2 33.8	68.2 31.8	41.1 58.9	38.8 61.2	38.0 62.0	38.6 61.4	77.9 22.1	75.0 25.0	96.8 3.2	98.0 2.0	8.9 91.1	4.6 95.4	— —	— —	58.7 41.3	59.4 40.6

pointing to the large amount of freights earned by British shipping, because this applies to the Imperial as well as the foreign share of the trade. In the United Kingdom and British America the proportion of the total export trade to foreign countries is appreciably less than the imports from those regions. On the other hand, in British Asia, British Africa and Australia the proportions of exports to foreign countries are larger than the proportions of imports. Further it is noticeable that in general where the proportion of imports has increased so also has the exports.

The following is a brief summary of the facts established by the present investigation :—

1. The aggregate external trade (imports and exports) of all the constituent parts of the Empire amounted in 1910 to 1,802*l.* millions ; of this 688*l.* millions, or 38 per cent., represented inter-Imperial trade.

2. The total imports into the Empire amounted to 956*l.* millions, of which 612*l.* millions, or 64 per cent., come from foreign countries.

3. The total exports from all parts of the Empire amounted to 846*l.* millions ; of this 502*l.* millions, or 59 per cent., went to foreign countries.

4. Inter-Imperial imports are growing more rapidly than imports from foreign countries. Between 1905 and 1910 the former increased by 32 per cent., and the latter by 22 per cent.

5. On the other hand, exports to foreign countries are growing more rapidly than inter-Imperial exports. The former showed an increase of 35½ per cent. in the years 1905 to 1910, against 32 per cent. in the latter.

6. The “special” imports from foreign countries into the United Kingdom are growing less rapidly than into the rest of the Empire. The former increased in five years from 396*l.* to 454*l.* millions, or 15 per cent. ; the latter increased from 104*l.* to 158*l.* millions, or by 50 per cent.

7. Similarly, the domestic exports from the United Kingdom to foreign countries are growing less rapidly than from the rest of the Empire. In the former case the increase was from 216*l.* to 283*l.* millions, or 31 per cent. ; in the latter from 155*l.* to 219*l.* millions, or 41 per cent.

8. Hence in both cases—imports and exports—the volume of the trade, and the intimacy of which this might be regarded as a measure, with foreign countries is growing rapidly both in the case of the United Kingdom and the rest of the Empire, but appreciably more rapidly in the latter than in the former case.

9. Dependence on foreign countries means, in general, dependence on foreign Europe. British Europe, Africa and Oceania respectively depend upon foreign Europe for their supplies more than on any other foreign parts.

10. There is some tendency for the largest part of the foreign trade of British countries to be derived from foreign countries in the same continent; this may be due to the advantages of contiguity.

I cannot close without an acknowledgment of my great indebtedness to Mr. A. S. Read and to Mr. M. I. Trachtenberg, for their invaluable assistance in the laborious work connected with the preparation of the tables in this paper.

APPENDIX I.

The following list of countries represents the grouping of British and foreign countries employed in the present paper. It is based mainly on the classification of the United States Department of Trade and Commerce:—

(a) BRITISH.

Europe.

United Kingdom,	Malta, including Gozo and Comino.
Channel Islands.	Gibraltar.
Cyprus.	

Asia.

British India.	Protected Malay States.
Bahrein Islands.	Ceylon and Dependencies.
Aden and Dependencies and	British North Borneo.
Sokotra.	Brunei.
Straits Settlements and De-	Sarawak.
pendencies, including Labuan.	Hong Kong.
Federated Malay States.	Wei-hai-Wei.

Africa.

British South Africa.	British West Africa.
Nyasaland Protectorate.	Mauritius.
Uganda Protectorate.	Seychelles.
East Africa Protectorate.	Ascension.
British Somaliland.	St. Helena.
Zanzibar Protectorate.	

North America.

Canada.	British Honduras.
Newfoundland and Labrador.	British West Indies.
Bermuda.	

South America.

British Guiana, Falkland Islands.

Oceania.

Australia, including Tasmania.	Tonga, or Friendly Islands.
New Zealand.	Solomon Islands.
Papua.	Gilbert and Ellice Islands.
Fiji.	Other British Islands in the Pacific.

*(b) FOREIGN.**Europe.*

Russia in Europe.	Belgium.	Austria-Hungary.
Sweden.	France.	Greece.
Norway.	Portugal.	Greenland and Iceland.
Denmark, including Farøe Islands.	Azores.	Bulgaria.
Germany.	Spain.	Servia.
Holland.	Switzerland.	Roumania.
	Italy.	Montenegro.

Asia.

Dutch Possessions in Indian Seas (exclud- ing New Guinea).	Portuguese Possessions in Indian Seas.	Siam.
French Possessions in India.	Macão.	China.
French Indo-China.	Turkey in Europe and Asia, including Crete.	Japan.
Portuguese Possessions in India.	Arabia.	Korea.
	Persia.	Russia in Asia.
	Afghanistan.	Countries not designated.
		Islands in Indian Seas not designated.

Africa.

German West Africa.	Portuguese East Africa.	Egypt.
German East Africa.	Barbary.	Tripoli.
Algeria.	Canary Islands.	Tunis.
French West Africa.	Spanish Ports in North Africa.	Morocco.
French Somaliland.	Spanish West Africa, including Fernando Po.	Congo Free State.
Madagascar.	Italian East Africa.	Liberia.
Bourbon (Réunion).		Abyssinia.
Madeira.		Countries not designated.
Portuguese West Africa.		

North America (including Central American States, Panama and West Indies).

United States.	Cuba.	San Salvador.
Dutch West Indies.	Hayti and San	Nicaragua.
St. Pierre and Miquelon.	Domíngo.	Costa Rica.
French West Indies.	Mexico.	Panama.
Porto Rico.	Guatemala.	Danish West Indies.
	Honduras.	

South America.

Dutch Guiana.	Peru.	Bolivia.
French Guiana.	Chile.	Argentina.
Colombia.	Brazil.	Countries not designated.
Venezuela.	Uruguay.	
Ecuador.	Paraguay.	

Oceania.

German New Guinea.	French Possessions in	Hawaii.
German Possessions	in Pacific.	Islands in the Pacific, not
Pacific.	Philippine Islands and	designated.
Dutch New Guinea.	Guam.	

APPENDIX II.

The following table gives an approximate estimate, based on the *Statesman's Year-Book* (1913), of the population in each of the British and foreign groups referred to in this paper:—

	Foreign Countries.	British Countries.	Total.
	Millions.	Millions.	Millions.
Europe	404	46	451
Asia	550	323	873
Africa	100	36	136
North America†.....	120	9	129
South America	52	0.3	52
Oceania	10*	6	16

* Including Philippines 8,600,000.

† Including Central America and West Indies.

DISCUSSION *on* MR. ROSENBAUM'S PAPER.

MR. BIRCHENOUGH, in proposing a vote of thanks to the reader of the Paper, said he always felt on occasions of this kind that the portions of the Papers which they heard read hardly represented a tithe of the labour which went to their preparation. Mr. Rosenbaum stated in the course of his Paper that he had set before himself the task of "finding out and measuring the extent of the growth of the trade in different parts of the British Empire with one another and with foreign countries," and he had amply carried out his task in the eleven tables which he had given them. To those of them who laboured in the field, those eleven tables, setting out as they did so lucidly, clearly and completely the underlying factors of Imperial trade, would be of immense service and advantage. He did not offer any criticism upon the manner in which Mr. Rosenbaum had dealt with the corrections connected with official returns. There were many present with a larger technical knowledge of statistics than he pretended to possess who, if they chose, would be able to deal with those questions. He, however, wished to associate himself with Mr. Rosenbaum in expressing regret at the absence of any uniform plan in the preparation and publication of Imperial trade returns. He thought they must all have felt when they began to study foreign trade, and not least Imperial trade, how important it was they should have some common system with regard to the classification, with regard to dates, with regard to the inclusion of bullion or the exclusion of bullion, the inclusion or exclusion of freights and duties, and so on. He supposed it would take a long time before they could get anything like international agreement on such questions, and it might be impossible to get international agreement; but he thought they all ought to strive for a common Imperial system for the presentation of trade returns. Until they had succeeded in doing that, there could be no doubt that the amount of trouble they all had to take in investigating and compiling results would be enormously increased, and most unnecessarily increased. He hoped when Mr. Rosenbaum continued his labours, as he had indicated he would in a series of other Papers, he would go rather more closely into the question of the effects of proximity or contiguity upon Imperial trade, for the reason that it raised a very interesting and very important question of Imperial communications about which he would say a few words later. He would not say anything about the effect of tariffs upon Imperial trade, though he thought in a Society such as theirs they ought to be able to deal with the effect of tariffs on a scientific basis, and independently of political questions. He would be ashamed if the Royal Statistical Society could not deal with the effect of tariffs on trade without party feeling. With regard to the question of the influence of investments upon Imperial trade, it had often occurred to him during the last twenty years that a very interesting piece of work remained to be done in that connection. He was not quite sure whether the Society had ever had a Paper upon the influence of

investments upon exports. If they regarded Great Britain as being at once the greatest trading country and the greatest money lender in the world, it was quite evident that her position as the greatest money lender of the world must have a very great influence upon our export trade, and more especially upon our Imperial trade. He thought it was equally clear that the financial dependence of the other sister States of the Empire upon the money market in London must also have a very determining effect upon the direction and growth of their imports from the mother country. He imagined it would probably emerge from any investigation that years of great loans were also years of very large Imperial exports. In any case, the subject of the influence of investments, and the influence of our position as the largest lender of capital in the world, was one which he thought ought to be investigated with great care in connection with general trade returns, and more especially Imperial returns. Then the question of the influence of emigration was one which he thought might be investigated with great advantage. In his experience, the fact that our fellow subjects of the Empire mainly came from this country and therefore had the same tastes, the same fashions, the same prejudices as ourselves, had a very considerable influence on the character of the trade we did with them, and for that reason it was extremely important that we should direct the stream of emigration as far as we could into territories under the flag. He was sure that Mr. Rosenbaum would deal with the various ramifications of the influence of emigration on a very comprehensive scale. On the question of contiguity, he did not think Mr. Rosenbaum would suggest that he had dealt at all fully with that point in his Paper. He gave certain hints which were extremely valuable, but he hoped for a fuller and more comprehensive treatment later on. There was, no doubt, a tendency on the part of portions of the Empire to gravitate towards the orbit of their larger industrial neighbours. One would rather expect the West Indies, for instance, to increase at all events their export trade to their great neighbour the United States. If it went to Canada, that remained in the Empire. It always seemed to him that they ought to do everything in their power by the organisation of our system of Imperial communication to counteract that centrifugal tendency of the more distant portions of the Imperial family. They could see for themselves that every reduction in the length of time it took to bring produce from distant parts of the Empire to Great Britain, did thereby *ipso facto* widen the area of the Imperial trade. The reduction of time by one week, or even one day, meant that one could bring produce which suffered by carriage to Great Britain and place it on the market in a saleable condition, which one could not have brought but for the saving of that day, or week.

Mr. FRANK DEBENHAM, in seconding the vote of thanks, said that, with Mr. Birchenough, he attached especial importance to the tables, not only because of the labour that was thrown into a Paper of that kind, but because they had a real abiding value, and as time went on they came to be the most important feature of the work of

the lecturer. Mr. Birchenough had referred to the hesitation which the lecturer appeared to show in including the Inter-Imperial trade in the statistics of the aggregate trade of the Empire. He did not think that there ought to be any hesitation on that point, because, after all, it was a contribution, and a very important contribution, to the aggregate trade of the Empire. By happy accident it was no doubt a duplication of the trade that was done between the Mother Country and those who first received her productions ; but ultimately it became part, and a most essential part, of the aggregate trade of the Empire, as much so as the direct commerce of the Mother Country with the various colonies. He was also very glad to find that Mr. Birchenough disclaimed any sort of party feeling with regard to the discussion of tariffs, which was to be the subject of a Paper promised by Mr. Rosenbaum. It was perhaps a healthy sign that Mr. Birchenough had made that disclaimer. On an exciting subject of difference he thought one might say it had not always been so, but perhaps the great subject of Tariff Reform had been very much spoiled and prejudiced, in the view of those who advocated it, by identifying that subject with one party. Of course in that matter the Free Trader had a certain advantage, because he did not concern himself especially with the fact that he was a Free Trader.

Sir G. PAISH said he wished to offer one or two observations, one of which was that in compiling the statement of Imperial trade, he would suggest to Mr. Rosenbaum that he should not leave out the precious metals. Gold was an important product of Australia and South Africa, and those countries had to pay for a large part of the goods they imported by means of the gold they produced and exported. Therefore, they could not leave the gold exports out of a statement purporting to show the trade of the Empire. The figures had been left out in the Paper, but they had not been left out of the Board of Trade statistical abstract. Of course, the gold exported by Great Britain was not her own production. It was a re-export, and should be dealt with as such. He thought they would all be glad to get the Paper and to study it. One thing impressed upon one by the Paper was the fact that our Empire trade had expanded in such a remarkable manner, not only as between various parts of the Empire, but as between the Empire and foreign countries. At one time, we were under the apprehension that the high foreign tariffs would cause our trade with foreign countries to suffer severely ; but fortunately, our fears had not been realised. In spite of the high tariffs of foreign countries, our trade with them has gone on expanding in a really remarkable manner. He was glad that Mr. Rosenbaum proposed to deal with the question of foreign investments. When they invested capital abroad freely their foreign trade expanded rapidly, and the period taken in the Paper, from 1905 to 1910, was a time in which they had greatly expanded their investments in other countries, and especially with the Colonies. In fact, the growth of the trade of the United Kingdom in recent years had been due, undoubtedly, to the fact that London had been the greatest money market in the world, and

had lent so freely to other nations. The great investment of capital they had made in recent years would bring a large permanent income to the Mother Country.

Sir JAMES WILSON said he wished to ask one question, and also to make a suggestion in regard to the method of calculation. He understood that the large increase shown in the value of the trade of the different countries between 1905 and 1910 might be partially due to an increase in prices, and not entirely to an increase in the actual quantity of commodities exchanged. He asked whether the writer could give any idea as to how much of that increase was due simply to a rise in the gold prices of commodities. The suggestion he wished to make was simply to emphasize what Sir George Paish had said. In studying the trade of India, he had found it necessary to include the statistics relating to treasure as well as those relating to commodities. They were shown separately in the Indian statistics, but it seemed to him quite impossible to get a proper idea of the true exports and imports of India, unless one included treasure in the total. As silver was now no longer turned into currency in India unless imported by the Government for that purpose, the silver imported into that country was almost as much a mere article of merchandise as iron or copper or any other metal, and he thought it should be treated merely as part of the commodities imported for which India had to pay by the export of other commodities. The case was nearly the same with gold, of which there were such enormous imports also. Only a comparatively small fraction of that gold entered into use as currency, and the rest was hoarded. It was an import into India for which she had to pay, and unless it was taken into account in the statistics they had only an incomplete idea of what the imports and exports actually were. As Sir George Paish had pointed out, the large quantity of gold exported by South Africa every year was as much an export as would be the export of wheat or any other commodity, and had to be paid for by the import into South Africa of other articles of trade. He understood the writer of the Paper had also excluded from the statistics regarding trade, articles imported by the Governments of the different countries. Taking the case of India, the Government imported a large quantity of rolling stock which he understood had been excluded from the statistics of the trade of India. Surely again that made the account incomplete. What the Government imported in the way of rolling-stock or any other commodity had to be paid for or allowed for somehow in the exchange of articles between India and other countries, and unless they included those figures also they had not an accurate idea of what the international trade actually was.

Sir ATHELSTANE BAINES said that there were two points in the Paper which had struck him as open to question. Sir James Wilson had just referred to one of them. It seemed inadvisable to exclude bullion from the returns of countries in which the metals were produced, for there bullion was an important article of export. In other countries, on the contrary, it was merely a medium of exchange,

India occupied a middle position, in that it imported bullion as merchandise and absorbed it, no one quite knew how, and it was introduced, also, especially within the last twenty years, in connection with the currency policy of the Government. It was thus very difficult to see how this article should be treated in the tables, but on the whole he thought it should not be excluded. Then amongst other improvements introduced by the Board of Trade, there was one which he hoped might some time be included, that is, the substitution of some term for "re-exports," which always grated on him, as the goods thus entitled were only exported once. There were those connected with the Board present, and perhaps one of them might come forward with a more accurate term. With the next question Mr. Debenham had dealt cursorily. Mr. Rosenbaum had used various terms for the factor of contiguity or adjacency, which was a very important question, though he did not think they need discuss it fully on the present occasion. When he read the Paper through the first time he was prepared to differ from the author in the grouping of the countries, because he had been accustomed to look at the trade from the standpoint of climatic conditions. He would separate, that is, the tropical from the temperate zones, by which most of the manufacturing industry would be segregated into one part of the world, and the raw material produced elsewhere would also be localised into groups. He would only mention, as an instance, the grouping of the West Indies with North America, and British Guiana, which fell into the same climatic group, with the Falkland Islands, which produced only wool and mutton. Similarly, he was not at all sure that the character of the trade of Japan justified its inclusion with that of India, as it seemed to him a sort of counterpart, in the east, of this country, in the west. He associated himself most heartily with all that previous speakers had said about the great merits and interest of the Paper.

Mr. H. V. READE said he was not prepared to go into the subject of the Paper, and the only thing he wished to take up was a remark of the last speaker about the word "re-exports." He was sure that all who had to use it were fully conscious that it was very inaccurate. Unfortunately they had not been able to find any substitute which would express in one word "exports of foreign and colonial merchandise" which was really what it meant. They would be pleased to consider some other word if Sir Athelstane Baines would suggest it.

Major CRAIGIE said he supposed that not many members would remember one of the Presidential Addresses of the Society by Sir Rawson Rawson in 1884. Appended to that Address there were valuable tables referring to the development in trade of the Colonies and the British Empire in various parts, with comparisons as to the Colonial relations of other countries which one would very much like to apply to the modern conditions unfolded by Mr. Rosenbaum so far as it could be done. Mr. Rosenbaum had told them that only very recent years were possible for the special comparison which

he made. He imagined that the comparisons, though not in so strict a form, could be carried further back, allowing for those differences of classification and method of making returns which had recently been introduced. One feature which the Paper opened with and which he hoped all would bear in mind, had been already referred to by the speakers before him. This was the extreme complexity of the field they were entering upon in making international comparisons of trade. This matter had been before the International Statistical Institute on many occasions, and two most valuable Papers showing in detail some of the pitfalls in the differences in the methods of the different countries might be found in the Institute's *Bulletin*, as read in St. Petersburg in 1897 by their former President, Sir Alfred Bateman, and again by Sir Alfred Bateman and Mr. Fountain of the Board of Trade in London in 1905. From the columns of values there shown and summarised, the wide differences in the method of countries lead one nearly to the conclusion that the international comparisons were statistically impossible. Only the other day he had met several of his friends in the Institute in discussion at the committee meeting at Rome, and the extreme difficulty of any attempts to compare the total trade of different countries were necessarily admitted to be a serious barrier to just conclusions. He therefore hoped that in the future discussions they were promised, they would also have technical papers on the reconstruction of the methods of trade accounts, and that some kind of uniform classification to which a general assent among a certain number of countries was accorded might be secured. They were dealing to-night with a most important subject, and he was glad to see it dealt with, but it must not be forgotten they were dealing with it by the aid of very imperfect tools in the returns before them at present.

Mr. MACROSTY suggested that, as the term "re-exports" was now quite well understood, it would be a mistake to change it in search for a more suitable word and would only lead to confusion. To criticise Mr. Rosenbaum's Paper would require that one should have given to it at least a considerable fraction of the long time which he must have devoted to the compilation of it, and therefore it was hardly possible to do anything more than make one or two suggestions quite on the fringe of things. He asked how far Mr. Rosenbaum had taken into account the export of diamonds from Cape Colony; because he gathered from the way in which he had presented his table of exports in inter-colonial trade that he derived that table from his previous table of imports, and, as everyone knew, South African diamonds figured only to an exceedingly small extent in their records of imports from South Africa, as they came in in other ways. He would like to urge that Mr. Rosenbaum should take into account the movement of bullion and of Government stores in dealing with International trade. Strictly he really ought to go further and include a good deal of ships' stores and bunker coal which were to all intents and purposes exports that had to be paid for by imports from the countries to which the ships bearing them were trading. Of course there was not the material available to enable Mr. Rosenbaum to group those

two things in the statistics, but he thought it would be proper to allude to that matter in a note to the tables. The only other thing he wished to say was, to hint a criticism as to the satisfactoriness of adding together exports and imports and making the addition the measure of trade. It was a thing, as he knew, that they had been doing for years past, but it had always seemed to him it was not quite sound. It was rather like adding a man's debts and his money together and saying he was worth the total. That criticism did not in any degree impair the value of Mr. Rosenbaum's analysis of the imports and exports of the inter-colonial trade taken separately.

Mr. H. V. READE, with reference to what had just been said, said there was an International Congress at Brussels about two years ago, on which he had represented this country, and an attempt was made there to arrive at an international classification for the purpose of comparison. They had arrived at a list of 200 headings after discussion, and it was hoped that eventually a permanent Bureau at Brussels would get import and export statistics annually from all countries, and would classify them on that basis, which would much facilitate international comparisons. Of course, certain difficulties would remain, especially the difficulty of value, which was arrived at in very different ways by different countries. Also, if they came to compare the trade between different countries, the various principles on which imports and exports are classified—under countries of consignment, countries of shipment, or countries of origin. He thought, nevertheless, if the Brussels proposals came into force it would be a great improvement.

Mr. J. C. STAMP asked the reader of the Paper to give them another word in relation to the time-element. When one found a comparison between two single years, one was always prepared for certain special difficulties. It was not necessary to quarrel with the portion of 1905 and 1910, in relation to the trade cycles. They seemed to him to be admirably placed; but he asked what Mr. Rosenbaum's experience had shown in compiling those figures upon the question of the stability of the figures in the smaller areas. For instance, in many of the smaller areas he had given them, food-stuffs occupied a most important position. Now, if one of the years was a year in which there were splendid harvests in Canada and India, but poor harvests in the Argentine and Russia, and another year was a year in which those conditions were reversed, surely a very material influence upon the respective figures would result. He asked how far Mr. Rosenbaum's experience enabled him to show that a comparison between the years 1905 and 1910 would be borne out by comparison between the years 1904 and 1909, and as to whether there might not be a considerable shifting in the percentage results due entirely to changes in the harvests and resultant exports of these countries, where food-stuffs took a prominent position.

Mr. JOSEPH BURTT DAVY said that as a visitor from another part of the Empire he would like to express his appreciation of the Paper they had had, and to support the expression of opinion that Government Stores should be dealt with in such statistics, at any

rate, as regards such parts of the Empire as the Union of South Africa. He was not in a position to state off-hand what were the total imports of Government Stores into South Africa, but where railway extension was taking place at such an enormous rate the amount was certainly large, and he thought the same would apply to Government Stores for the construction of telegraph and telephone lines. Perhaps the figures would be more affected there than in some other parts of the Empire where the railways, at any rate, were not under Government control.

Mr. REW said that he was sure the Society would be very glad to welcome the visitor from the Transvaal who had last spoken. He would not have risen to take part in the discussion, but for one reason. He was sure the Society would be pleased to hear from Mr. Reade that the deliberations of a Congress held in Brussels were likely to materialise in something which would improve the comparability of trade statistics of the world generally. He hoped Mr. Reade's expectations would not be disappointed. Mr. Birchenough had suggested that something might be done if an attempt were made to put the statistics of the Empire's trade, and he might say other statistics as well, on a more uniform basis. He was sure that that suggestion would receive the most cordial approbation of the Society. On many occasions they had expressed the view that the multiplicity of methods within the Empire, and he might say within the United Kingdom, by which statistics were collected and published was an evil which they would like to see removed. They had suggested that in the United Kingdom the fact that there were three separate census authorities was not an arrangement which could be considered ideal, and if greater co-ordination of statistics could be secured the Society would greatly rejoice.

Mr. ROSENBAUM, in reply, said there were one or two criticisms, for which he was very grateful, which had been raised by a number of those who had taken part in the discussion; and to these he proposed to make a brief reply. To a small extent some of those criticisms appeared to him to be based on some slight want of appreciation of the entire purpose of the Paper. The investigation was started with the object of determining the relative volume and growth of trade in and between the different parts of the Empire. That investigation was necessarily shaped by the kind of materials which are available. It was easy to criticise the omission of certain items like bullion, diamonds, Government purchases, and so on. There might be a good reason for the omission of such items, and the only question which remained was whether the broad results were thereby affected. It was contended by the author that the results were not materially affected by the course adopted. This method had been forced on him by the fact that the trade returns of the different parts of the Empire differed in so many fundamental respects from one another. The Board of Trade published a series of totals which aggregated merchandise, bullion, Government stores, and so on; everything, in fact, that was found in any trade returns was included in the hotch-potch called the Board of Trade total. This method, attractive in its simplicity, was not possible as soon as

it was desired to analyse the trade by groups of foreign or British countries. Sir George Paish would remember, as soon as he recalled the fact to his notice, that in the returns of many countries, the origin and destination of the bullion trade was not given in the same detail as ordinary merchandise. If they took the South African returns, for example, they would find it difficult to trace the ultimate destination of the millions of gold annually exported from that country. Clearly the easier way was to remove these items altogether, and it was reasonable to do this if the general conclusions were not thereby affected. An important question had been asked by Mr. Macrosty as to whether he had dealt with diamonds, and how. He had not forgotten diamonds, but they were not included; and the reason was that diamonds, if he remembered rightly, came here mostly through the parcel post; but though they came here they did not remain. Most of them passed away to other countries; which countries he did not know. Again, he had ignored them right through the tables, and he did not think any serious error was introduced by ignoring them, so long as they remembered that they had been kept out. He admitted, when they came to some of the later Papers which he contemplated, it would be necessary to take some of the omissions into account. He agreed that the question of proximity was one of very great importance. Mr. Birchenough had very kindly referred to that, and he was very glad at the same time to know that his interpretation of what he had intended to include in future Papers coincided exactly with his intentions. He did not intend to deal with the factor of investments and the factor of emigration in precisely the way they had been referred to. Another important question was as to what was the value of those figures in regard to small countries. He thought some idea of the effect was obtained by the examination of tables IV and VIII, where they would see that—taking the figures which were printed in ordinary type, and in which the trade was less than a million sterling, and therefore which included those very small communities to which reference had been made—the growth of trade was quite different in kind from anything which appeared in the other parts of the Empire. They got increases, for example, of 348 per cent., 206 per cent. and 160 per cent., and if they turned to page 57 there was 400 per cent., showing that there was something quite abnormal in the movement which had taken place in those countries, which, he thought, answered the question which had been raised. There was only one further point raised by Mr. Rew. He did intend to suggest—and he was glad that one of the Secretaries of the Society had already taken up the suggestion—that the Society should interest itself in trying to secure some uniformity in the trade returns of the British Empire. He thought the Society was well able to do so, and he thought it ought to undertake it. He expressed his thanks for the reception which had been given to the Paper.

The following Candidate was elected a Fellow of the Society:—
Ernest Riley.

REPORT OF THE COUNCIL

For the FINANCIAL YEAR ended December 31, 1912, and for the SESSIONAL YEAR ending June 17, 1913, presented at the SEVENTY-NINTH ANNUAL GENERAL MEETING of the ROYAL STATISTICAL SOCIETY, held at the Rooms of the Royal Society of Arts, John Street, Adelphi, London, W.C., on June 17, 1913.

THE Council have the honour to submit their Seventy-ninth Annual Report.

The roll of Fellows on December 31 last, as compared with the average of the previous ten years, was as follows:—

Particulars.	1912.	Average of the previous Ten Years.
Number of Fellows on December 31	854	877
Life Fellows included in the above.....	175	173
Number lost by death, withdrawal, or default	57	55
New Fellows elected	44	47

Since January 1 last, 26 new Fellows have been elected, and the Society has lost 40 by death, resignation, or default, so that the number on the list, excluding Honorary Fellows, on June 17, 1913, is 840.

The Council regret that the increase in the number of Fellows reported last year has not been maintained. After a net increase of 23 over the number at the end of 1910, following on an increase of 22 in the preceding year, the total on the books of the Society has fallen by 13. The present total shows an improvement on 1909 and 1910, and is about the same as that in 1908, but it is evident that the number of new Fellows joining each year should be at least sufficient to counterbalance the natural losses if the Society is to maintain its position. The Council cannot but think that, in view of the widespread interest now evinced in statistics, the membership of the Society should be increased, and they appeal to the Fellows generally to co-operate with them in bringing the advantages and

claims of the Society to the notice of those who may be suitable for election as Fellows.

The Society has to deplore the death, since June last year, of the following Honorary Fellows: Dr. John S. Billings (United States); M. Alfred de Foville (France); Dr. Ernst Mischler (Austria); Mr. Edwin C. Nowell (Tasmania); His Excellency Pierre Semenow (Russia); and Dr. Edward Young (United States); and of the undermentioned Fellows:—

	Date of Election.
Anderson, John A.	1889
<i>c d p</i> Avebury, Rt. Hon. Lord, F.R.S.	1865
<i>c d</i> Bailey, Arthur H., F.I.A.	1855
<i>d</i> Bell, James T.	1884
Broom, Andrew	1874
<i>z d</i> Cohen, Nathaniel L.	1887
<i>d</i> De Broë, Emil C.	1885
Hansard, Luke	1876
Harris, David	1868
Hunt, Richard A.	1883
*Leete, Joseph	1879
Marshall, W. B.	1887
*Prance, R. H.	1877
<i>c d p</i> *Ravenstein, Ernest G.	1874
<i>d p</i> Schloss, David F., M.A.	1891
<i>c d</i> Sim, J. D. Stuart, C.B.	1904
Smith, Howard S.	1877
<i>d p</i> Sykes, Dr. John F. J.	1900
Verney, Frederick W.	1894
Wandsworth, Rt. Hon. Lord	1911
Warren, R. A.	1888
*Westlake, Dr. John	1879
Woodhouse, Lister	1902
*Yglesias, Miguel	1888

* Life Fellow.

c Ex-Member of the Council.

d Donor to the Library.

p Contributed Papers to the Society's Transactions.

The death-roll during the past year has been an unusually heavy one, and it includes the names not only of Honorary Fellows of world-wide reputation, but also of distinguished Fellows at home who have been intimately associated with the Society's activities and progress.

By the death of Lord Avebury, who was elected a Fellow in 1865 on the proposal of Dr. Farr, the Society loses an ex-President of high distinction. After serving on the Council in 1868, 1869 and 1882, and as a Vice-President in 1889, he was elected President for the Session 1900-01, and he continued in office during the

following Session. From 1872 to 1899, when the Society's funds were transferred to its own name, he was a trustee of the Society.

The Council lost by death Mr. J. D. Stuart Sim, C.B., and, among those who had previously served on the Council, Mr. A. H. Bailey, F.I.A., Mr. Nathaniel L. Cohen, and Mr. Ernest G. Ravenstein. Mr. Bailey was elected a Fellow in 1855, and became a member of the Council in 1878. From that date until the end of 1910 his services on the Council were ungrudgingly given. He was a Vice-President in 1882 and 1883, and for many years he was Chairman of the Library Committee. On a number of occasions he represented the Council as auditor of the Society's accounts. Mr. Nathaniel L. Cohen was elected a Fellow in 1887 and served on the Council from 1897-98 until 1902-03, and again from 1904-05 to 1908-09.

The Council regret to report the resignation, owing to advancing years, of Mr. T. A. Welton, F.C.A., whose connection with the Society dates from 1855, and with the Council from 1877.

Since June, 1912, the following new Fellows have been elected:—

Aiyar, S. N., M.A.	Hutchinson, Professor Lincoln.
Argile, T. E.	Kitchin, Joseph.
Babson, R. W.	Loban, G. T.
Bal Krishna, Professor, M.A.	Lucas, The Right Hon. Lord.
Barriol, A. A.	Macready, W. R.
Bell, C. N.	Nevill, Louis B.
Bennion-Booth, H.	Nixon, J. W., B.Sc.
Brigstocke, A. M., I.C.S.	Norman, Frank A.
Burrows, V. A., F.I.A.	O'Hara, F. C. T.
Butler, Dr. William.	Palmer, Truman G.
Chadwick, Percy.	Phillips, John, F.R.C.I.
Chapman, Professor E. H.	Pownall, G. H.
Chaston, John.	Riley, Ernest.
Chen, Yi.	Rockliff, Percy.
Collard, William.	Sabel, Paul.
Datta, Krishna Lal, M.A.	Shove, G. F., B.A.
Fraser, Malcolm.	Trachtenberg, H. L., B.A., A.I.A.
Hall, Professor Frederick.	Wigram, R. F.
Hart, Charles.	Wilkinson, Rev. J. Frome, M.A.
Heinbrod, G.	Wood, Mrs.
Horwitz, Israel.	Wotzel, A. A.
Hughes, T. H.	Zimmern, Miss Dorothy M., M.A.

The financial condition of the Society is shown in the Auditors Report appended hereto, the value of the invested stock held by the Society being taken at current prices. On January 1, 1912, there was a balance from 1911 of 54*l.* 5*s.* 10*d.* The receipts of the year were 2,157*l.*, and the expenditure was 2,174*l.* Apart from the additional expenditure involved in the publication and distribution of the Report of the Special Committee on Infantile Mortality, the

Society has not during the past year been called upon to make any exceptional outlay, but the accounts indicate, even more distinctly than last year, the increase in the Society's normal expenditure. It is very desirable also that the Society should be in a position to undertake special inquiries without putting an undue strain upon its resources. A summary of the income and expenditure of the Society for the past twenty-five years will be found in Appendix B.

The thanks of the Council have been tendered to the Auditors for their honorary services.

The Papers read before the Society during the Session 1912-13 have been as follows :—

1912.

I.—November 19 DUDFIELD, Dr., M.A. Still-births in relation to Infantile Mortality.

II.—December 17 The PRESIDENT'S Address.

1913.

III.—January 21 GONNER, Prof. E. C. K., M.A. The Population of England in the Eighteenth Century.

IV.—February 18..... HUTCHINSON, Prof. Lincoln. The Panama Canal and Competition for Trade in Latin America, the Orient and Australasia.

V.—March 18 SNOW, Dr. E. C., M.A. Some Statistical Problems suggested by the Sickness and Mortality data of certain of the Large Friendly Societies.

VI.—April 15 FLUX, A. W., M.A. Gleanings from the Census of Production Report.

VII.—May 20 THOMPSON, Sir William J., M.D. The Census of Ireland, 1911.

VIII.—June 17 ROSENBAUM, S., M.Sc. The Trade of the British Empire.

The cordial thanks of the Society are due to those Fellows who by the reading of papers, have maintained, in a high degree, the interest and value of the Society's proceedings.

The additions to the Society's Library and the use made of it during the twelve months ending May 31, are shown in the statement given in Appendix C. The monthly average of books lent during the year ending May 31, 1913, was 61, and that of borrowers, 36. The total number of Fellows and others using the Library during the same period was 1,424, or an average of 119 persons per month.

The Report of the Special Committee on Infantile Mortality, whose work had not been completed at the end of last Session, was presented to the Council in July, when the Report was adopted, and a cordial vote of thanks was unanimously accorded to Dr. Dudfield and the members of the Committee. It was further resolved that the Report be forwarded to the various Government

Departments at home and abroad, with a covering letter commending the conclusions of the Committee to the serious consideration of the authorities concerned. The Report was published in the *Journal*, December, 1912, and has been placed on sale in a separate form.

In November the Council appointed a Special Committee to consider the question of the morbidity and mortality statistics in the United Kingdom. The Report of the Committee, which confined its labours to the preparation of an extensive bibliography of the statistical data at present available relating to morbidity and mortality in the United Kingdom, has been adopted by the Council, and will be published in the *Journal*.

The Council made no award in the Howard Medal Essay Competition, 1911-12.

Under the conditions laid down in the regulations for the award of the Guy Medal, the Council have awarded a medal in silver to Dr. Reginald Dudfield for his paper on Still-births in Relation to Infantile Mortality, and for special work done by him in the interest of the Society.

The following Fellows (nominated in accordance with By-law 14) are recommended for election as President, Council, and Officers of the Society for the Session 1913-14 :—

PRESIDENT.

Professor F. Y. Edgeworth, M.A., D.C.L., F.B.A.

COUNCIL.

W. M. Acworth, M.A.	*Professor Charles S. Loch, D.C.L.
W. G. S. Adams, M.A.	*Bernard Mallet, C.B.
Arthur L. Bowley, Sc.D.	Sir Theodore Morison, K.C.I.E., M.A.
Sir Edward W. Brabrook, C.B., Dir.S.A.	Arthur Newsholme, C.B., M.D.
Professor S. J. Chapman, M.A.	Sir George Paish.
Sir Ernest Clarke, M.A.	Sir Lesley Probyn, K.C.V.O.
Timothy A. Coghlan, I.S.O.	R. Henry Rew, C.B.
*Geoffrey Drage, M.A.	Simon Rosenbaum, M.Sc.
*Reginald Dudfield, M.A., M.B.	Charles P. Sanger, M.A.
Alfred W. Flux, M.A.	T. H. C. Stevenson, M.D.
H. Fountain, C.M.G.	*David A. Thomas, M.A.
Major Greenwood, M.R.C.S.	*Sir William J. Thompson, M.D.
Noel A. Humphreys, I.S.O.	Alfred W. Watson, F.I.A.
E. A. Hastings Jay, M.A., LL.B.	Sir James Wilson, K.C.S.I.
A. W. Waterlow King, J.P.	G. Udny Yule, M.A.

Those marked * are proposed as new Members of Council.

TREASURER.

Sir Richard Biddulph Martin, Bart. (*Hon. Vice-President*).

HONORARY SECRETARIES.

R. Henry Rew, C.B. (*and Foreign*). G. Udny Yule, M.A. A. W. Flux, M.A.

The abstract of the Treasurer's account of receipts and payments, and the estimate of assets and liabilities on December 31, 1912, together with the report of the Auditors on the accounts for the year 1912, are appended.

Signed on behalf of the Council,

F. Y. EDGEWORTH,

President.

R. H. REW,

G. UDNY YULE, } *Hon. Secretaries.*

A. W. FLUX, }

C. M. KOHAN,

Assistant Secretary.

APPENDICES TO ANNUAL REPORT.

A (i).—ABSTRACT of RECEIPTS and PAYMENTS for the YEAR ending
DECEMBER 31, 1912.

RECEIPTS.				PAYMENTS.			
	£	s.	d.		£	s.	d.
Balance in Bank, } Current Account, } December 31, 1911 }	52	12	10	Rent and Taxes:—			
Balance of Petty } Cash }	-	14	4	Rent, less Tax.....	£357	16	8
„ Postage ... }	-	18	8	Taxes, 1911-12	41	3	4
			54 5 10	Total	399	-	-
Dividends on } 2,371l. 6s. Consols, } Account A }	55	16	4	Less Sub-let ...	25	-	-
Dividends on Con- } sols, 10,527l. 12s. 3d., } Account B (Guy } Bequest) }	247	16	8				374 - -
Dividend on G.N.R. } Stock, 1,000l. }	37	13	4	Fire, Light, and Water	63	6	4
			341 6 4	Furniture and Repairs	5	8	1
Annual Subscriptions:—				Salaries, Wages and Pension.....	619	19	6
26 Arrears	54	12	-	“Journal,” Printing } and Paper }	£686	17	1
593 for year 1912, + 1s. 1,245	7	-		„ Shorthand } Reporting } „ Literary } Services }	30	18	8
17 in Advance for } 1913 }	35	14	-		58	4	2
			1,335 13 -				775 19 11
636				Ordinary Meeting Expenses	24	11	3
Compositions	105	-	-	Advertising	28	15	-
“Journal” Sales	334	7	8	Postage and delivery of “Journals”	51	17	9
Advertisements in “Journal”	18	7	6	Stationery and Sundry Printing...	72	13	2
Library. R. Econ. Soc., &c.	11	11	6	Library	80	19	4
			2,200 11 10	Miscellaneous Expenses	75	11	4
Mr. T. A. Welton for extra printing	10	10	-				2,173 1 8
				Purchase of “Journals”	£1	-	-
							1 - -
							2,174 1 8
				Balance at Bank, De- } cember 31, 1912 }	£34	10	-
				Balance of Petty Cash	1	2	6
				„ Postage }	1	7	8
				Account }			37 - 2
Total	£2,211	1	10	Total	£2,211	1	10

(Signed)

“RICHARD B. MARTIN,
“Treasurer.

“February 4, 1913.”

“CHAS. ATKINSON,
“S. CHAPMAN,
“THOS. A. WELTON, } Auditors.

A (ii).—ESTIMATE *of* ASSETS *and* LIABILITIES *on* DECEMBER 31, 1912.

LIABILITIES.		ASSETS.	
	£ s. d.		£ s. d.
Harrison and Sons, for } December "Journal" }	67 7 10	Cash Balances	37 - 2
Miscellaneous Accounts	207 5 5		
17 Subscriptions re- } ceived in advance... }	35 14 -		
	310 7 3	2,371 <i>l.</i> 6 <i>s.</i> Consols } (General Fund). } (Price, December } 31, 1912, 75 ⁵ / ₁₆ <i>l.</i>) ... }	1,785 17 8
		10,527 <i>l.</i> 12 <i>s.</i> 3 <i>d.</i> Con- } sols (Guy Bequest). } (Price, December } 31, 1912, 75 ⁵ / ₁₆ <i>l.</i>) ... }	7,928 12 2
Balance in favour of the Society } (Exclusive of (1) Books in } the Library; (2) Journals in } Stock; and (3) Pictures, Fur- } niture and Fixtures)	10,437 16 6	1,000 <i>l.</i> G.N.R. Pre- } ferred Converted } Ordinary Stock. } (Price, December } 31, 1912, 88 ¹ / ₂ <i>l.</i>) ... }	885 - -
			10,599 9 10
		Arrears of Subscriptions re- } coverable (say 25)	52 10 -
		Sundry debtors	59 3 9
	£10,748 3 9		£10,748 3 9

A (iii).—BUILDING FUND (ESTABLISHED *July* 10, 1873): STATEMENT
of the FUND on DECEMBER 31, 1912.

This Fund is invested in Metropolitan Consolidated 3*l.* 10*s.* per Cent. Stock. On December 31, 1911, the Fund was represented by 52*l.* 11*s.* 11*d.* of that Stock. With the dividends received during 1912, additional Stock to the amount of 17*l.* 10*s.* 8*d.* was purchased by the Bank of England for the Society. Accordingly, on December 31, 1912, the total investment amounted to 545*l.* 2*s.* 7*d.* Stock.

“RICHARD B. MARTIN,
“*Treasurer.*

"February 4, 1913."

(Signed)

“ CHAS. ATKINSON, }
“ S. CHAPMAN, } *Auditors.*
“ THOS. A. WELTON, }

A (iv).—"REPORT OF THE AUDITORS FOR 1912.

"The Auditors appointed to examine the Treasurer's Accounts for the Year 1912

"REPORT:—

"That they have compared the Entries in the Books with the several Vouchers for the same, from January 1 to December 31, 1912, and find them correct, showing the Receipts (including a Balance of 54l. 5s. 10d. from 1911) to have been 2,211l. 1s. 10d., and the Payments 2,174l. 1s. 8d., leaving a Balance in favour of the Society of 37l. 0s. 2d. on December 31, 1912.

"They have also had laid before them an Estimate of the Assets and Liabilities of the Society at the same date, the former amounting to 10,748l. 3s. 9d., and the latter to 310l. 7s. 3d., leaving an excess of Assets over Liabilities of 10,437l. 16s. 6d., exclusive of (1) Books in the Library; (2) Journals, &c., in Stock; and (3) Pictures, Furniture, and Fixtures.

"They have verified the Investments of the Society's General Funds (2,371l. 6s. Consols + 1,000l. G.N.R. Stock); the Guy Bequest (10,527l. 12s. 3d. Consols); the Building Fund (545l. 2s. 7d. Met. Cons. Three and a half per cent. Stock); and also the Bunker's Balance (34l. 10s.); all of which were examined and found correct.

"They farther find that at the end of the year 1911 the number of Fellows on the list was 867, which number was reduced in the course of the year to the extent of 57, by Death, Resignation, or Default; and that 44 new Fellows were elected or restored to the list, leaving on the list on December 31, 1912, 854 Fellows of the Society.

(Signed)	" CHAS. ATKINSON,	} Auditors.
	" S. CHAPMAN,	
	" THOS. A. WELTON,	

" February 4, 1913."

Year.	Number of Fellows on December 31.	Number of Life Fellows included therein.	Losses during Year by Deaths, &c.	Gains by Election, &c., during Year.	Income from				All Sources.	Expenditure.			Amount Invested on December 31.	Year.	
					Annual Subscrip- tions.	Composi- tions.	Journal Sales.	Investments and other Sources.		Total.	Of which				
											£	£			£
1888....	1,059	172	58	140	1,686	334	171	101	2,292	2,003	711	58	£	2,500	1888
'89....	1,060	175	69	70	1,678	126	229	82	2,115	2,060 ^f	623	146		2,500	'89
1890....	1,063	177	65	68	1,764	84	155	94	2,097	2,096 ^a	567	68		2,900	1890
'91....	1,019	172	80	36	1,707	42	146	181	2,076 ^g	1,957 ^h	582	172		2,900	'91
'92....	994	171	70	45	1,634	84	158	104	1,980	1,883 ⁱ	539	94		2,900	'92
'93....	964	176	66	36	1,560	124	128	92	1,904	1,921	578	63		2,900	'93
'94....	933	180	67	36	1,491	105	152	82	1,830	1,904	619	75		2,900	'94
'95....	928	180	59	54	1,468	63	180	82	1,793	1,823 ^j	576	56		2,900	'95
'96....	910	181	48	30	1,478	42	168	84	1,772	1,787	571	44		2,900	'96
'97....	892	182	58	40	1,472	145	157	83	1,857	1,857 ^k	650	50		2,900	'97
'98....	878	180	57	43	1,451	115	182	105	1,853	1,825	609	55		3,300 ^l	'98
'99....	896	181	44	62	1,432	95	167	127	1,821	1,805	564	33		3,300	'99
1900....	923	179	36	63	1,514	21	189	148	1,872	1,817	521	53		3,300	1900
'01....	926	177	49	52	1,464	63	211	129	1,867	1,823	518	42		3,300	'01
'02....	932	177	52	58	1,504	21	255	152	1,932	1,839	543	73		3,300	'02
'03....	939	174	49	56	1,517	84	293	151	2,045	1,875	593	91		3,300	'03
'04....	925	175	58	44	1,407	124	253	152	1,936	1,931 ^a	521	92		3,400	'04
'05....	911	178	59	45	1,465	168	220	220	2,073	2,074 ^m	665	67		11,975 ⁿ	'05
'06....	891	177	63	43	1,464	82	225	408	2,274 ^o	1,988	645	95		11,449	'06
'07....	861	172	63	33	1,363	82	327 ^q	408	2,180	2,401 ^p	571	87		11,746	'07
'08....	855	170	46	40	1,339	84	254	494 ^r	2,171 ^r	2,428 ^s	602	92		11,920	'08
'09....	825	167	82	52	1,307	84	273	396	2,060	2,369	611	99		12,084	'09
1910....	845	172	37	57	1,304	141	326	974 ^t	2,746 ^t	2,726 ^u	803	74		11,210	1910
'11....	867	174	40	62	1,415	126	308	405	2,255	2,372 ^v	721	104		10,875	'11
'12....	854	175	57	44	1,336	105	334	382	2,157	2,174	776	81		10,599	'12

^a Includes purchase of Government stock.
^f Includes cost of part iv of Index to Journal.
^g Includes Mrs. Lovegrove's legacy of 100l.
^h Includes outlay for Gay Medal and for binding "The Times."
ⁱ Includes outlay for drainage repairs.
^j Includes cost of subject-index to Journal.
^k Includes cost of doing up interior of premises.
^l Includes 400l. G.N.R. Stock, purchased with Mr. J. Heywood's Legacy of 500l.
^m Includes 100l. to International Statistical Congress Fund.
ⁿ Includes the Gay Bequest. The total invested is now valued at current prices.
^o Including 126l. for sale of books.
^p Includes purchase of 600l. G.N.R. Stock.
^q Includes special sales.
^r Includes Sanford Bequest, 100l.
^s Includes 160l. for Catalogue and 288l. for purchase of Sta. etc.
^t Includes 500l. from sale of Consols and 68l. Income-Tax refunded.
^u Includes 436l. for re-decoration of premises, installing electric light and furniture.
^v Includes 169l. for furniture and carpets and "at home" expenses.

C.—Numbers of Books Added to the Library and Lent, and Numbers of Borrowers from the Library in the Sessional Years 1910-11, 1911-12, and 1912-13.

Months.	Works Received.*		Books Lent.				Borrowers.		Fellows and Visitors using the Library.				Months.					
	1910-11.	1911-12.	1910-11.		1911-12.		1912-13.		1910-11.	1911-12.	1912-13.	Called after 5 p.m. or remained after 5 p.m.						
			Works.	Vols.	Works.	Vols.	Works.	Vols.				1911-12.		1912-13.				
1912.																		
July	814	988	830	88	64	88	34	46	61	72	33	23	35	97	76	101	—	—
August	—	—	—	39	52	52	59	51	54	54	24	32	31	44	72	81	—	—
September	—	—	—	68	88	35	49	54	65	42	22	22	31	65	55	90	—	—
October	—	—	—	91	101	77	84	91	117	56	48	48	60	95	130	123	27	19
November	—	—	—	49	59	69	95	55	68	35	44	37	45	103	153	101	36	19
December	239	249	310	97	71	97	60	75	72	81	40	37	45	80	85	142	22	41
1913.																		
January	101	68	55	81	101	100	130	56	60	54	61	61	34	120	113	112	38	21
February	54	62	66	64	74	93	121	44	73	38	62	28	28	84	131	137	23	41
March	64	82	82	95	114	86	98	56	80	62	49	33	33	122	140	134	34	35
April	66	61	35	40	52	101	111	72	88	29	55	40	40	119	128	108	32	22
May	86	97	111	105	122	63	73	62	76	65	41	34	34	115	132	166	32	49
June	75	62	50	65	53	67	40	46	42	42	26	32	32	79	129	113	29	20
Sessional year....	1,499	1,669	1,540	832	1,023	823	1,008	714	890	520	500	440	440	1,103	1,344	1,408	273	267
Monthly average	125	139	128	69	85	68	84	59	74	43	42	36	36	92	112	117	30	29

* These figures represent the number of works entered during the year, under "Additions to the Library," in the *Journal*, and not the number of separate volumes; they are exclusive of about 170 weekly, monthly, and quarterly periodicals regularly received.

PROCEEDINGS of the SEVENTY-NINTH ANNUAL GENERAL MEETING,
held on June 17, 1913.

The President, Professor F. Y. EDGEWORTH, M.A., F.B.A., in the
Chair.

THE REPORT of the Council was presented.

The PRESIDENT moved that the Report of the Council, the Abstract of Receipts and Payments, the Estimate of Assets and Liabilities, and the Report of the Auditors be adopted, entered on the Minutes and printed in the *Journal*.

Major CRAIGIE, in seconding the motion, said he could not help echoing a word that he found in the Report impressing on the younger members of the Society the necessity for getting further recruits for carrying on their work. If the members were declining they would not be in a position to make those inquiries which had been hinted at that evening and to replace those who dropped off. They had had many losses during the year. There had been the death of Lord Avebury, and the very heavy loss of one of their Honorary Fellows, and many names that were passing out from the line of statistical work. He hoped it would be the duty of the Society in adopting the Report to bear in mind that they should recruit the necessary people to supply the place of those who in the course of nature passed away.

The motion was put to the meeting, and carried unanimously.

The Ballot for the election of the President, Council and Honorary Officers for the session 1913-14 was then taken, and the Scrutineers (Mr. P. M. REA and Mr. H. L. TRACHTENBERG), reported that they had been unanimously elected.

The HON. SECRETARY (Mr. R. H. Rew) having read out the list of defaulters, the President declared that they had ceased to be Fellows of the Society.

The HON. SECRETARY announced that the subject selected for essays in competition for the Howard Medal in 1913-14 was "The extent to which during the past 20 years expenditure of public funds in England and Wales had supplemented the resources of individuals, and its probable effects."

The CHAIRMAN announced that the Council and Officers proposed had been duly elected.

Mr. PERCY ASHLEY moved a cordial vote of thanks to the President, Council and Officers for their services during the past year.

Mr. H. V. READE seconded the motion, which was carried unanimously.

THE ESTATES OF THE COLLEGES OF OXFORD AND THEIR MANAGEMENT.¹

By L. L. PRICE, Treasurer of Oriel.

THE statistical data of the first portion of this investigation are based upon the published accounts of the colleges and University of Oxford for the year 1911, and are in continuation of those presented in Papers read before the Royal Statistical Society and published in the *Journal*.²

The first part of the inquiry refers to the colleges as a whole, and establishes the broad facts (*a*) that the gross external receipts of the colleges and the University were in 1883, in round figures, 318,000*l.*; in 1893, 305,000*l.*; in 1903, 335,000*l.*; and in 1911, 387,000; and (*b*) that the net external receipts were for the corresponding years, successively, 206,000*l.*, 177,000*l.*, 193,000*l.*, and 227,000*l.* Accordingly, the gross external receipts for 1911 exhibited an increase on 1903 of 52,421*l.*, compared with an increase during the previous decade of 29,797*l.*; and the net external receipts similarly showed an increase of 34,102*l.* in the last eight years as contrasted with an increase during the preceding ten of less than half that amount (*viz.*, 15,871*l.*) Although the net external receipts were both in 1893 and 1903 below the figure for 1883, and the external expenditure had grown throughout the whole period (from 112,000*l.* successively to 128,000*l.*, 142,000*l.*, and 160,000*l.*), yet the improvement was so marked in the eight years between 1903 and 1911 that the gross external receipts for the colleges and the University, being 68,764*l.* larger than the total for 1883, were accompanied by net external receipts exceeding the total for 1883 by 20,365*l.*

While few colleges show a diminution of receipts between 1903 and 1911, four colleges in themselves account for 45,471*l.*, out of the 52,421*l.* increase in the gross external receipts, and for 25,402*l.* of the improvement of 34,102*l.* in the net external receipts. The largely augmented receipts from houses, and especially from houses and sites of houses let on long lease, are responsible for the chief part of the improvement in the finances of the colleges. The University has not, recently at least, been directly benefited by this factor; and it must be remembered that the most considerable influence is due to a few out of the whole number of colleges. The actual increase is detailed below:—Taking the receipts from houses let at rack-rent and on long lease,

¹ Summary of a Paper, read before the Surveyors' Institution, on May 23, 1913.

² "The recent depression in agriculture as shown in the accounts of an Oxford College, 1876-90." *Journal*, vol. lv, 1892.

"The Colleges of Oxford and agricultural depression." *Journal*, vol. lviii, 1895.

"The accounts of the Colleges of Oxford, 1893-1903, with special reference to their agricultural revenues." *Journal*, vol. lxxvii, 1904.

and subtracting the decrease in the receipts from houses let on beneficial lease, the total receipt from houses, amounting in 1911 to 127,559*l.*, exhibited an increase of 33,908*l.* over 1903, of 69,007*l.* over 1893, and of 90,824*l.* over 1883. While receipts from lands were in 1883 179,853*l.*, and from houses 36,735*l.*, in 1911 the corresponding figures were 177,835*l.* and 127,559*l.*, *i.e.* the ratio has increased from about one-fifth to about thirteen-eightieths. Adding the receipts from houses to the receipts from land and tithe, the totals obtained are in 1883, 1893, 1903, and 1911 respectively, 266,833*l.*, 262,598*l.*, 293,956*l.*, and 351,357*l.*; the last figure showing an increase over 1903 of 57,401*l.*, over 1893 of 88,759*l.*, and over 1883 of 84,524*l.*

The remaining items in the receipts show no considerable deviations from previous returns. As regards external expenditure, two-fifths of the external receipts are absorbed by the external expenditure, and this proportion is one which remains fairly constant. Rates, taxes, and insurance, however, show a considerable advance. The figures for 1911 (32,670*l.*) is about twice that for 1883 and 1893, and represents an advance of a third as much again on that for 1903. A fifth of the expenditure and between an eleventh and a twelfth of the receipts are equal to the sum thus shown. In some instances the payment of tithe may be included under this heading, while in many, and probably most, cases it is comprised in miscellaneous rents and rent-charges, which amounted in 1911 to 12,124*l.* Repairs and improvements, like rates and taxes, are a very heavy, if a necessary, burden, and like them too, they seem ever to be tending upwards. In 1911 they cost 48,658*l.*, as compared with the 26,279*l.* in 1883, 34,975*l.* in 1893, and 42,383*l.* in 1903. About a third of the expenditure now goes in this direction, and corresponds to about an eighth of the receipts. Nor is the tale fully told unless the expenditure from capital upon repairs be added to that made out of income. It amounted in 1911 to some 14,000*l.* Such an addition would increase the proportion of the receipts spent on repairs from an eighth to a sixth; but as the expenditure from capital is often or generally defrayed by loan, which has to be repaid in subsequent years, perhaps the more correct mode of reckoning is to add the charges for the estate loans, which amounted in 1911 to 22,006*l.* to the 48,658*l.* for repairs. The total sum thus reached (70,664*l.*) represents not much less than a fifth of the receipts.

The second part of the inquiry refers to the accounts of Oriel College. The total acreage of the landed estates of the college has undergone no considerable change since 1890, and may be reckoned now, as then, as amounting to about 6,000, with a rental of about 7,200*l.* in 1912, as contrasted with 7,600*l.* in 1890 and 10,500*l.* in 1876-77.

From the figures relating to Oriel College (which might be taken as typical of most of the others) two deductions are to be drawn, *viz.* :—

- (i) A recent improvement in agricultural rentals has not restored the position before the depression.
- (ii) There is a great difference between gross and net income.

In illustration of the first deduction it is to be remembered that while the rental in 1912 was below that in 1876-77, as shown above, it is above that in 1902, when it reached one of the lowest figures on record, and was only 6,946*l.* Yet the improvement, although maintained, and on the whole progressive since that date, is not very great, and the highest figure reached in the last decade, viz., 7,169*l.* for 1909, is not much above the lowest figure in the whole record—that of 6,929*l.* for 1897. This broad conclusion, that the recovery is real but slight, is confirmed when the rental of the estates now purely agricultural is compared at quinquennial interval since 1887. At that time, when the writer's treasurership commenced, depression had reduced the total rental of the landed estates (excluding the trust property) from 10,279*l.* in 1876-77 to 8,047*l.* The figure for 1887 for the agricultural estates was 8,010*l.*, in 1892 it was 7,254*l.*, in 1897 6,847*l.*, in 1902 6,856*l.*, in 1907 6,992*l.*, and in 1912 7,087*l.* Separating the three large agricultural estates from the others, the corresponding figures were 5,436*l.*, 4,976*l.*, 4,371*l.*, 4,234*l.*, 4,314*l.*, and 4,421*l.* Here, too, then the figure for 1912 was above the lowest figure of the series, but much nearer to that than to the highest figure, that for 1887. On the other hand, the cash receipts from the estates (excluding the trust property) were higher in 1912 than they were in 1887 (being 6,228*l.* against 6,147*l.*), and the arrears outstanding at the close of the year had diminished from 3,078*l.* to 74*l.* The fall in the rent of farming tenancies between 1876 and 1912 was some 48 per cent.

In regard to the second deduction (viz., that there is a great difference between net and gross income) it is evident that in spite of the reduction of the college expenditure by payment of debt since 1887 the net external receipts represent some two-fifths only of the gross external receipts, although in 1887 the external expenditure had absorbed about three-fourths, leaving little more than a quarter. While taking quinquennial averages agency and management have remained fairly stationary, and law charges are not considerable, rates, taxes, and insurance have grown from 1,278*l.* to 1,437*l.*, and finally to 1,584*l.*, and repairs and improvements, which were 1,543*l.* in the first quinquennium, became 2,237*l.* in the second, and 2,364*l.* in the third and last. These four items of expenditure added together for the period 1908-12 absorb not much less than half the external receipts, and in 1912 they swallowed up about that proportion from lands, houses, and tithe alone. A further calculation of the total receipts from lands and houses for the last twenty-five years, and the total expenditure on repairs out of income and from capital raised by loan to be repaid subsequently out of income, shows that more than a quarter of the receipts from these sources has been required for repairs. This conclusion is substantiated by adducing the example of the largest agricultural estate of the college during the last twenty-five years, and considering the items of expenditure year by year, as shown in the subjoined table:—

Outgoings on a single large estate year by year (Oriel College).

Net amounts receivable.	Rates, taxes, and tithes.		Repairs charged on year.		Repairs cost spread over some years.		Repairs met by loan.		Income tax on rent charge.		Total for rates, taxes, and tithes.		Total for repairs.		Total for deductions.		Net receipts.		
	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	
1887.....	3,632	16 6	450	11 10	175	12 4	146	4 3	512	1 0	2 5 2	452	17 0	863	17 7	1,316	11 7	1,716	1 11
'88.....	2,908	0 6	422	12 6	213	4 4	553	11 10	255	3 5	1 19 5	424	11 11	824	19 7	1,249	11 6	1,718	8 7
'89.....	2,692	11 6	372	4 3	235	11 5	222	1 2	300	0 0	1 15 0	373	19 3	757	12 7	1,131	11 10	1,500	19 8
1890.....	3,025	15 2	354	15 4	162	11 10	5	14 6	30	0 0	1 15 0	386	10 4	198	6 4	584	16 8	2,410	18 6
'91.....	2,796	10 10	366	16 9	196	2 1	170	1 3	913	5 7	1 15 0	368	11 9	1,399	8 11	1,678	0 8	2,118	10 2
'92.....	2,687	7 8	397	7 2	175	7 8	263	10 0	226	10 0	1 17 11	389	9 2	665	7 8	1,634	9 10	1,652	17 10
'93.....	2,113	11 1	359	3 3	179	5 0	398	5 5	—	—	2 2 4	361	0 11	577	10 5	938	11 4	1,174	19 9
'94.....	2,334	0 0	368	13 8	234	18 10	163	17 0	—	—	2 2 4	370	16 0	308	15 10	769	11 10	1,614	8 2
'95.....	2,524	13 1	371	9 8	275	19 3	424	16 6	—	—	2 2 6 8	362	19 7	509	15 9	1,074	12 1	1,450	1 0
'96.....	3,086	11 7	360	12 11	244	13 5	215	13 7	—	—	2 2 6 8	455	16 5	580	7 0	953	6 7	2,133	5 0
'97.....	2,635	19 4	453	9 9	245	10 8	215	13 7	—	—	2 2 6 8	456	7 6	245	10 8	701	7 1	1,934	12 3
'98.....	2,628	6 0	451	0 10	269	18 9	35	0 0	—	—	2 2 6 8	440	17 0	304	18 9	761	6 3	1,896	19 9
'99.....	2,586	7 9	438	10 4	371	6 9	275	7 5	—	—	2 12 6	430	15 6	646	14 2	1,087	11 2	1,497	16 7
1900.....	2,587	4 0	466	7 11	193	15 2	86	0 0	—	—	3 13 0	470	0 11	279	15 2	710	10 8	1,875	17 0
'01.....	2,584	4 0	481	5 7	392	3 9	152	19 9	56	17 6	4 4 3 1	488	7 1	602	1 0	1,072	1 11	1,515	2 1
'02.....	2,681	5 2	481	5 9	432	15 8	95	18 4	563	13 4	4 4 3 1	519	7 5	1,300	18 10	1,577	16 0	1,906	8 0
'03.....	2,406	15 3	485	1 5	468	5 8	83	14 7	9	10 5	3 5 8	494	9 10	1,392	7 4	1,829	6 3	2,006	18 11
'04.....	2,883	2 0	490	19 10	580	8 5	90	12 10	—	—	3 10 0	494	9 10	591	10 8	1,829	6 3	2,006	18 11
'05.....	2,580	8 8	499	18 4	556	19 2	261	17 7	300	0 0	3 10 0	494	8 4	671	1 3	1,019	17 9	1,356	17 6
'06.....	2,435	19 8	509	12 8	675	13 3	245	3 6	420	0 0	3 10 0	513	5 1	1,118	16 9	1,613	5 1	1,717	10 11
'07.....	2,435	19 8	509	12 8	675	13 3	245	3 6	420	0 0	3 10 0	513	5 1	1,118	16 9	1,613	5 1	1,717	10 11
'08.....	2,772	3 6	514	17 10	386	9 0	90	0 0	42	0 0	3 10 0	518	7 10	518	9 0	1,036	16 10	1,735	6 8
'09.....	2,678	8 0	497	14 11	1	0 0	491	4 7	258	0 0	3 12 11	501	7 10	1,169	1 9	1,661	9 7	1,916	18 5
1910.....	2,635	2 0	523	12 10	1	0 0	100	0 0	—	—	4 1 8	527	11 6	506	15 7	1,034	10 1	1,600	11 11
'11.....	2,987	11 0	525	6 3	1	0 0	88	5 0	—	—	4 1 8	529	7 11	439	5 11	968	13 10	2,019	0 2
'12.....	2,634	15 4	538	17 3	1	0 0	287	1 8	500	0 0	4 1 8	512	18 11	1,269	16 5	1,812	15 4	822	0 0
69,644 19 10	11,658 11 7	8,847 0 7	4,978 10 3	5,120 10 10	74 12 0	11,713 3 7	18,946 1 8	30,659 5 3	38,985 14 7										

* These sums were charged on an account fed by a fixed sum a year charged on the income of the College.

† These sums were paid from loans raised by sale of stock in the hands of the Board of Agriculture or by mortgage, and in either case periods (generally ten years) were fixed for repayment, and corresponding charges for repayment made on the income of the College.

‡ In 1909 and the following years a rent-charge was paid for carrying pipes for water supply of £1 a year.

REPORT OF THE SPECIAL COMMITTEE ON MORBIDITY AND MORTALITY STATISTICS IN THE UNITED KINGDOM.

1. The Special Committee was appointed by the Council on December 12 last with the following reference:—

To consider the question of the morbidity and mortality statistics in the United Kingdom, and to report to the Council.

2. The Committee as originally appointed consisted of—

Reginald Dudfield, M.A., M.B.

A. W. Flux, M.A.

M. Greenwood, Junr., M.R.C.S., L.R.C.P.

Sir Shirley F. Murphy, F.R.C.S.

A. Newsholme, M.D., C.B.

T. H. C. Stevenson, M.D.

A. W. Watson, F.I.A.

The Committee elected Dr. Dudfield as Chairman.

3. On January 16, the Council, at the request of the Committee, authorised the Committee to co-opt such additional members as the Committee deemed desirable. Sir Edward Brabrook accepted an invitation to serve.

4. Before proceeding to report the actions of the Committee, it will be useful to set out the facts which led to its appointment.

5. On November 12 last a letter, dated 11th of that month, received from the British Section of the International Association for Labour Legislation, was considered by the Council. The letter covered resolutions adopted by the International Association at the Conference held in Zurich, September 10-13 of last year. The resolutions

(a) called for “a report on the essential differences in the morbidity and mortality statistics relating to the working classes in the different trades and in the different countries . . .”; and

(b) directed the National Sections to report “on the methods of compiling, and the present position as regards, morbidity and mortality statistics relating to the working classes.”

The British Section sought the help of the Society with reference to what the Section described as “the first step,” viz., the preparation of a report on “the methods of compiling, and the present position as regards, morbidity and mortality statistics relating to the working classes” in this country.

6. The Committee, having carefully considered the letter from the British Section of the International Association and the wider reference from the Council, decided that the first business of the Committee should be the preparation of a bibliography of the statistical data at present available relating to morbidity and mortality—to include infantile mortality—in the United Kingdom generally and that the period to be covered by such bibliography should not extend as a rule further back than 1870.

7. The first step was the preparation of a list of publications in which the required statistics are to be found, such publications including those issued by the various departments of the Government, local authorities and their officers, learned societies and private individuals. The list of reports, documents, &c., which appeared to the Committee to be useful will be found in Appendix to this Report.

8. Letters have been addressed to the Local Government Boards of England and Wales, Scotland and Ireland, to the Registrar of Friendly Societies, to the Chief Inspector of Factories, and to the Institute of Actuaries, seeking information falling within the reference to the Committee.

Letters have been inserted in the medical journals inviting hospitals and other medical institutions to furnish the Committee with any information which such institutions might have at their disposal. Individual letters have also been sent to certain of the larger hospitals throughout the country. Members of the Committee have written to or seen various officers and others who were thought to be likely to possess information desired by the Committee.

9. We find the following general statistical data are available in each of the three kingdoms—England and Wales, Scotland and Ireland:—

A. With reference to morbidity—the notified diseases,

In

- (1) The annual reports of the medical officers of health of—
in England and Wales and Ireland—administrative (sanitary) areas ;
in Scotland—the public health districts ;
- (2) The annual reports of the Local Governments of all countries ; and
- (3) The reports of the Registrar-General of England and Wales.

B. With reference to mortality,

In

- (1) The annual reports of medical officers of health ; and
- (2) The reports of the Registrars-General.

Prior to 1911 the data published in the annual reports of the Registrar-General of England and Wales were tabulated for Registration Counties, districts and sub-districts. Beginning with 1911 the following important changes have been made:—

- (1) Local government administrative (sanitary) areas are substituted for registration areas ;
- (2) The International List of Causes of Death has replaced the Schedule of Causes of Death previously used ; and
- (3) The deaths of persons dying in any district who were residents of another district in England and Wales are excluded from the figures relating to the former and included in those of the latter, the district of their residence. A similar transference is made of births in workhouses and lying-in hospitals to the districts of residence of the mothers.

The tabulation in the reports of the Registrar-General of Scotland is now also based on the sanitary districts—the public health districts—and not on registration areas. The mortality statistics are corrected for deaths of non-residents, &c.

Some of the larger hospitals publish tabulations of admissions to their wards, but none of them any of patients treated in out-patient departments. A number of reports received by the Committee have been examined, and only two have been found to contain tables showing the distribution of admissions by disease, sex and age distinguishing recoveries from fatal termination. Mention may be made here of the weekly publication of hospital returns undertaken by the Association of Medical Officers of Health, financed by H.M. Treasury, in 1856. The publication was abandoned after little longer than one year.

An excellent form of tabulation has been framed by the Medico-Psychological Society for the use of medical officers of lunatic asylums.

REGINALD DUDFIELD,
Chairman.

April 2, 1913.

APPENDIX.

I. OFFICIAL PUBLICATIONS:

A. Parliamentary:

1. Papers and Returns:

Vaccination—Report of Select Committee—H.C. (246) 1871.

Still-births interment (352), 1891.

Still-births in England and other countries (279), 1893.

Lead Poisoning in Earthenware and China Works—H.C.—1901-05.

Report of Actuaries (National Insurance Bill), 1911. [Cd-5681.]

2. Royal Commissions:

Vaccination, 1887.

Tuberculosis, 1904-1909.

Poor Law and Relief of Distress, 1909.

B. Central Government:

1. General Register Offices:

England and Wales:

(a) Weekly returns of Births and Deaths—limited to London and Great Towns;

(b) Quarterly reports—for the whole Country: give tables of causes of death in London and 211 Towns; also tables of cases of infectious disease;

(c) Annual reports:

The following subjects were specially dealt with in the introductory letters to the Annual Reports of Registrar-General for England and Wales for the years 1880-1910:—

1880. Small-pox and vaccination. Suicides.

1881. Inadequate certification of causes of death.

1881. Seasonal distribution of deaths from measles.

Cancer.

1885. Hydrophobia. Diabetes.

I. OFFICIAL PUBLICATIONS—*Contd.*B. Central Government—*Contd.**England and Wales—Contd.*

- 1886. Scarlet fever—case mortality.
- 1887. Fifty years of civil registration.
- 1888. Hydrophobia, age and sex incidence of zymotic diseases.
- 1889. Chance of dying from cancer.
- 1891. Life table and causes of death first year of life.
- 1892. Northern enteric fever area.
- 1894. Influenza. New list of causes of death table showing relation between Dr. Farr's and Dr. Ogle's lists.
- 1895. Lists of registers and records in the custody of the Registrar-General. Medical inquiries. Enteric fever. Premature birth and congenital defects. Uncertified causes of death.
- 1896. Infantile mortality by sexes, survivors at end of first year of life. Cancer, phthisis, and respiratory diseases. Uncertified deaths in South Wales.
- 1897. Diphtheria and croup, cancer, tuberculosis (all forms), phthisis, tabes mesenterica, tuberculous meningitis. Inquests—causes of death.
- 1898. Diphtheria and croup, diabetes.
- 1899. Diabetes. Uncertified causes of death.
- 1900. Cancer, phthisis, diabetes, diseases of nervous system (excluding convulsions), diseases of circulatory system, diseases of urinary system.
- 1901. Lobar and broncho-pneumonia. Urban and rural mortality — all causes. Pneumonia. Phthisis. Cancer. Infantile and child mortality. Rheumatic fever.
- 1902. Urban and rural mortality.
- 1903. Corrected death rates in counties. Extension of international section.
- 1905. Child mortality and survivors. Infant mortality and fertility, diabetes, heart disease, cerebral hæmorrhage and apoplexy, appendicitis and acute and chronic nephritis. Extended tables of infantile mortality.
- 1906. Infantile mortality, temperature and rainfall. Infantile mortality in registration counties. Tuberculous meningitis and peritonitis. Alcoholism and cirrhosis of liver.
- 1907. Infantile mortality. "Immaturity." Epidemic mortality in international section. Case mortality in M.A.B. Hospitals from scarlet fever, diphtheria and enteric fever. Diphtheria mortality under 5 years and 5 to 10 years. Notes on estimates of population by A. C. Waters.
- 1908. High and low infantile mortality in towns. International section—Corrected death-rates. Diphtheria and enteric fever in towns. Diarrhœa under five years—urban and rural mortality.
- 1909. Mortality at ages. Infantile mortality. Diseases showing greatest increase or decrease in 1909 against 1876-80. Cancer. Childbirth.
- 1910. Method of estimating population. Deaths at each year of age. Pneumonia—Lobar, broncho- and undefined, and bronchitis.

(d) Decennial Supplements to Annual Reports—contain tables of occupational mortality.

I. OFFICIAL PUBLICATIONS—*Contd.*B. Central Government—*Contd.**Scotland:*

- (a) Weekly returns of births, deaths, and marriages in sixteen principal towns of Scotland.
- (b) Monthly returns of the births, deaths, and marriages registered in sixteen of the principal towns of Scotland with the causes of death at different periods of life.
- (c) Quarterly returns of the births, deaths, and marriages registered in the divisions, counties, and districts of Scotland.
- (d) Annual reports of the Registrar-General on the births, deaths and marriages registered in Scotland during the year.
- (e) Detailed annual reports of the Registrar-General of births, deaths, and marriages in Scotland.
The following subjects have been specially dealt with in the Detailed Annual Reports of more recent years:—
1901. Comparison between the old and new lists of causes of death.
1902. The correction of death-rates for age and sex distribution of population.
1904. Supplementary report on fifty years' vital statistics.
1905. Supplementary report on infantile mortality.
- (f) Decennial supplements to annual reports—contain tables of occupational mortality.

Ireland:

- (a) Weekly returns of births and deaths in the Dublin registration area, consisting of the City of Dublin and the Urban Districts of Rathmines and Rathcar, Pembroke, Blackrock and Kingstown; and in twenty-six of the principal Urban Districts in Ireland.
- (b) Quarterly returns of the marriages, births and deaths registered in the provinces, counties, Poor Law Unions, or Superintendent Registrars' Districts in Ireland.
- (c) Detailed annual reports of the Registrar-General for Ireland, containing a general abstract of the numbers of marriages, births and deaths registered in Ireland during the year.

Cancer in Ireland—Supplement to 38th Annual Report, 1903.

Reference should be made to the following tables in the Census Reports:—

1871—Gen. Rep., Pt. III, p. 44	{ The tables give the numbers of the temporarily and permanently-sick and infirm from various causes, distinguishing those at home from those in institutions, and grouped "under 5" and "over 5" by ages.
1881— " Pt. II, p. 268	
1891— " Pt. II, p. 396	
1901— " Pt. II, p. 442	
1911— " p. 146	

I. OFFICIAL PUBLICATIONS—*Contd.*B. Central Government—*Contd.*

2. Local Government Boards :

England and Wales :

(a) Weekly tabulations of cases of infectious disease notified in every sanitary area in the country ;

(b) Annual returns of Notifications. (First year, 1911.).

All Countries :

(c) Annual reports of

(i) the Board, and

(ii) the Medical Officer of the Board ;

(d) Reports of the Medical Inspectors ;

(e) Reports on various subjects :

England and Wales :

Public Health and Social Conditions. [Cd-4671.] 1909.

Enteric Fever, Tees Valley. [Cd-7054.] 1893.

Enteric Fever, Carrier Cases, 1910.

Epidemic Influenza. [Cd-7051.] 1893.

Cholera in England. [Cd-7539.] 1894.

Measles in England and Wales, 1896.

Consumption and the Provision of Sanatoria. [Cd-3657.] 1907.

Infantile and Child Mortality. [Cd-5263.] 1910.

Scotland :

Administrative Control of Pul. Phthisis in Glasgow, 1911.

Incidence of Ophthalmia Neonatorum in Scotland, 1912.

Ireland :

Belfast Health Commission, report to Local Government Board for Ireland. [Cd-4128.] 1908.

Tuberculosis in Ireland. Fol. 1908.

3. Home Office :

(a) Annual reports of the Chief Inspector of Factories —contain tables relating to accidents (including trade poisonings), to the inspections for certificates of fitness, &c. ;

(b) Annual reports of the Medical Inspector ;

(c) Annual returns under the Workmen's Compensation Act ;

(d) Special reports :

Use of Phosphorus in Matchmaking (1899). [Cd-9188.]

Manufacture of Lead Paints and Colours (1905). [Cd-2466.]

Incidence of Anthrax in Manipulation of Horse-hair, &c. (1906).

Anilin Black Dyeing (1906).

Dangerous Processes in Coating Metal with Lead (1908). [Cd-8793.]

Consumption Among Cornish Miners (1904). [Cd-2091.]

4. Board of Education :

Annual reports of the Principal Medical Officer.

5. Commissioners in Lunacy.

6. Registrar of Friendly Societies :

Special report on Sickness and Mortality in Friendly Societies—H.C.—1896. (303.)

I. OFFICIAL PUBLICATIONS—*Contd.*B. Central Government—*Contd.*

7. National Insurance Commissioners :

Report for the year 1912-13 on the Administration of the National Insurance Act, Part I (Health Insurance). [Cd-6907.]

Appendix v give statistical tables, and Appendix vi contains memorandum on

- (a) The Basis and Graduation of the Mortality Tables ;
- (b) Rates of Sickness and Disablement ; and
- (c) Issue Rates.

8. Departmental Committees :

Dangerous Trades (Certain Miscellaneous) (1896-99). 1896 [Cd-8149.] 1897 [Cd-8522.] 1899 [Cd-9073.] 1899 [Cd-9420] and [Cd-9509.]

Wool-sorting and Kindred Trades, Conditions of Work in (1897). [Cd-8506.]

Physical Deterioration (1904). [Cd-2175.] [Cd-2210.] [Cd-2186.]

C. Local Government :

1. Annual Reports by the Medical Officers of Health of :

- (a) Administrative Counties ;
- (b) Municipal and other Sanitary Areas.

2. Special Reports by the same officers : including those of

County of London :

Anthrax, 1894.

Diphtheria, 1894 ; 1898.

Enteric fever, 1892 ; 1895 ; 1900 ; 1904 ; 1911.

Scarlet fever, 1892 ; 1894 ; 1901 ; 1909.

Tuberculosis (Pulmonary), 1910.

Life-Table for London, 1902.

Brighton :

Life-Tables (1881-90), 1893 ; (1891-1900), 1903.

Glasgow :

Life-Tables (1881-90), 1894.

Haydock :

Life-Table (1881-90), 1898.

Manchester :

Life-Tables (1881-90), 1893.

Oldham :

Life-Table (1881-90), 1898.

Portsmouth :

Life-Tables (1881-90), 1896.

3. Annual and other Reports of the Metropolitan Asylums Board and other Infectious Hospital Authorities.

4. Reports by the Medical Officers of Education Authorities.

II. NON-OFFICIAL PUBLICATIONS :—

The following communications to learned societies and journals and monographs afford information supplementary to that contained in the official publications. The list does not profess to be exhaustive.

A. MORBIDITY AND MORTALITY—General :

Adam, T. (1904)—Life-table for Scotland, based on the Census enumeration of 1891-1901 and on the recorded deaths for the decennium 1891-1900. *Statistical Journal*, vol. lxxvii, 448.

II. NON-OFFICIAL PUBLICATIONS—*Contd.*A. MORBIDITY AND MORTALITY—General—*Contd.*

Burridge, A. F. (1885)—Summary of Infirmities from Annual Report of Registrar-General (1881). *Journ. Instit. Actuaries*, xxv, 109.

Chalmers, A. K. (1898)—An Inquiry into the Vital Statistics of School Ages. *Public Health*, vol. xi, 102.

[A discussion of the mortality rates for Scotland at ages 0—5 and 15—25, by sex and from selected causes.]

Dudfield, R. (1905)—A Critical Examination of the methods of recording and publishing Statistical Data bearing upon Public Health; with Suggestions for the Improvement of such Methods. *Statistical Journal*, vol. lxxviii, 140.

Greenwood, M., and Candy, R. H. (1910-11)—The Fatality of Fractures of the Lower Extremity, &c. *Statistical Journal*, vol. lxxiv, 365.

[Comparison of fatality rates in the experience of hospitals and in outside practice; German Krankenkasse, English Collective Investigation Committee, etc.]

Grimshaw, T. W. (1889)—Child Mortality in Dublin. *Statistical and Social Inquiry Society of Ireland*, vol. ix, Appendix.

[A statistical study of child mortality in Dublin compared with that in other towns of the United Kingdom, its causes, and how it may be reduced.]

Grimshaw, T. W. (1888)—A Statistical Survey of Ireland from 1840-88, being the opening Address for the Session 1888-89. *Statistical and Social Inquiry Society of Ireland*, vol. ix (part 68), 321.

[The survey is of a general nature, including vital statistics of Ireland, the housing of the people, pauperism and the consumption of intoxicants.]

Hewat, Arch. (1880-82)—On Mortality Tables, introducing a New Table of Mortality. *Proceedings Philosophical Society, Glasgow*, vol. xiii.

[Gives a short account of the different Life Tables and how they were calculated, and also a description of the Table submitted by him to the Society.]

Humphreys, Noel A. (1883)—The recent Decline in the English Death-rate, and its effect upon the Duration of Life. *Statistical Journal*, vol. xlv, 189.

[A Paper in continuation of that of G. B. Longstaff's (*vide infra*).]

Hutchins, Miss B. L. (1905)—Note on the Distribution of Married Women in relation to the Birth-rate. *Statistical Journal*, vol. lxxviii, 95.

[An attempt to elucidate the relation (for relation there must be) between the birth-rate and the present age of women who are married at certain ages.

Data used, census figures 1851-1901 and those relating to certain Lancashire Registration Districts.]

Johnson, S. (1910-11)—An attempt to show from what class the Outpatients of a Voluntary Hospital are drawn. *Statistical Journal*, vol. lxxiv, 630.

[An investigation into the economic class of the patients. The methods and classification of Rowntree were used, and in the results some 85 per cent. of the patients would appear to belong to the class of "primary" poor, at some time during their lives.]

II. NON-OFFICIAL PUBLICATIONS—*Contd.*A. MORBIDITY AND MORTALITY—General—*Contd.*

King, G. (1883)—Method used by Milne in the Construction of the Carlisle Table of Mortality. *Journ. Instit. Actuaries*, vol. xxiv, 186.

Knibbs, G. H. (1907)—The Classification of Disease and Causes of Death from the standpoint of the Statistician. *Inter-colonial Medical Society of Australia*, vol. xii, 332.

[Refers to development of systems of nosological classification.]

Longstaff, G. B. (1884)—The Recent Decline in the English Death-rate considered in connection with the causes of death. *Statistical Journal*, vol. xlvii, 221.

Macpherson, J. (1903)—Urban Selection and Mental Health. *Review of Neurology and Psychiatry*, vol. i, 65.

[Shows changes in urban and rural population in decades from 1861 to 1901 for England and Scotland separately.

Argues that a marked physical change of type occurs as result of urban selection. Quotes Ripley's "Races of Europe," p. 537. Urban type stronger as result of natural selection and able to resist disease.]

McVail, J. (1907)—*The Prevention of Infectious Diseases*. 306 pp., 8vo. London: Macmillan and Co.

March, Lucien (1911-12)—Some Researches concerning the Factors of Mortality. *Statistical Journal*, vol. lxxv, 505.

[Factors considered—race, climate, sex, marriage, order of birth and occupation.]

Martin, J. M. (1904)—An Inquiry into the Distribution of certain Diseases (Cancer, Phthisis and Pneumonia) on the western slopes of the Cotteswold Hills. *Public Health*, vol. xvii, 4.

[An analysis of 1574 deaths from the named causes registered in Stroud (Glos.) Registration District 1891-1902. The analysis based on sex, age, occupation and residence (geology of), &c.]

Mason, P. F. (1908)—The International Classification as applied to Morbidity Returns. *New York Medical Journal*, vol. lxxxviii, 1016.

[Suggests a classification for morbidity uses similar to the international classification of causes of death with certain changes rendered necessary for army purposes, each disease being numbered (a) according to international classifications; (2) consecutively.]

Newsholme, Arthur (1891)—Vital Statistics of the Peabody Building and other artisans' and labourers' block dwellings. *Statistical Journal*, vol. liv, 70.

[Consists largely of tables which analyse the above.]

Newsholme, Arthur (1896)—A National System of Notification and Registration of Sickness. *Statistical Journal*, vol. lix, 1.

[History of attempts to establish registration of sickness. Advantages of compulsory registration. Comparisons with foreign countries and recommendations.]

Rosenbaum, Simon (1905)—A contribution to the Study of the Vital and Other Statistics of the Jews in the United Kingdom. *Statistical Journal*, vol. lxxviii, 526.

[An examination of the mortality among Jews by sexes and ages (not causes), and the effects of such mortality (above the general average) on that of the Metropolitan Boroughs, in which Jews are mainly concentrated. Includes survivors' and expectation of life tables.]

II. NON-OFFICIAL PUBLICATIONS—*Contd.*A. MORBIDITY AND MORTALITY—General—*Contd.*

Rumsey, Henry W. (1871-72)—Certain Fallacies in Local Rates of Mortality. *Manchester Statistical Society*, vol. iv, 17.

[Arising from defective information—

(i) as to the influence of class and occupation;

(ii) as to the movements of population;

(iii) as to public institutions;

with some remarks on hospital mortality.]

Squire, W. (1879)—Some results from a Comparison of Registration of Disease with Returns of Mortality. *Practitioner*, vol. xxiii, 229.

[Deals with notification of infectious diseases in certain towns in England, from the time of its first year; Bolton, population 94,000, first authorization.]

Sutton, W. (1873)—Method used by Price in constructing the Northampton Life Table. *Journ. Instit. Actuaries*, vol. xviii, 107.

Tobin, R. F. (1908)—The Promotion of Uniformity in the Registration of Diseases in Hospitals. *Medical Press and Circular*, vol. lxxxv, 582.

[Alludes to the general lack of familiarity with the book "Nomenclatures of Diseases of the Royal College of Physicians." To promote uniformity in the registration of diseases in hospitals, advocates putting in every admission and discharge book alongside the column for the names of diseases a column for the numbers given to those diseases in the nomenclature.]

Walford, Cornelius (1881)—On the number of Deaths from Accident, Negligence, Violence and Misadventure in the United Kingdom and some other countries. *Statistical Journal*, vol. xlv, 444.

[Paper (suggested by Employers' Liability Act, 1880) falls into three divisions—historical, statistical and "practical."]

Warner, Francis (1896)—Mental and Physical Conditions among 50,000 Children, seen 1892-94, and the methods of studying recorded observations, with special reference to the determination of the causes of mental dulness and other defects. *Statistical Journal*, vol. lix, 125.

[Method of obtaining data for actuarial research, and statistical method employed. Etiology of defective conditions in relation with sex.]

Welton, Thomas A. (1880)—On Certain Changes in the English Rates of Mortality. *Statistical Journal*, vol. xliii, 65.

[Discusses certain changes observed in the rates of mortality (1846-75) and the causes of the increased mortality among males aged 35-65 years.]

Welton, Thomas A. (1907)—Memorandum as to Birth-rates and Marriage-rates in England and Wales. *Statistical Journal*, vol. lxx, 625.

[A comparison of the birth rates (averages for three years at quinquennial intervals between central years) in selected districts per 100 married women under 35—and an examination of the numbers of women enumerated as married and as compared with the registered marriages.]

Welton, Thomas A. (1911)—*England's Recent Progress: An Investigation of the Statistics of Immigration, Mortality, &c., 1881-1901.* lxiv + 742 pp., 8vo. London: Chapman and Hall.

II. NON-OFFICIAL PUBLICATIONS—*Contd.*A. MORBIDITY AND MORTALITY—General—*Contd.*

Welton, Thomas A. (1913)—Note on Urban and Rural Variations according to the English Census of 1911. *Statistical Journal*, vol. lxxvi, 304.

Worthington, Rev. A. W. (1870)—On the Unequal Proportion between the Male and Female Population of some manufacturing and other towns. *Statistical Journal*, vol. xxx, 68.

[Effect of sex and occupation, with particular reference to benefits and evils accruing therefrom, in various towns. Statistics of crime are also considered in this connection.]

B. SPECIAL DISEASES :

1. *Cancer* :

King, G. ; Newsholme A. (1893)—On the alleged Increase of Cancer. *Proceedings of Royal Soc.*, vol. liv ; also *Journ. Instit. Actuaries*, xxxvi, 120.

Symons, W. H. (1898)—Cancer in relation to the dwelling. *Public Health*, vol. xi, 156.

[A comparison of the mortality from "cancer" in Bath and the Southern Counties (large towns) with the remainder of England and Wales, by sex, age and occupation—also an estimate of the probabilities of two or more deaths from cancer occurring in the same house.]

Teece, R. (1901)—Increase of Cancer. *Journ. Inst. Actuaries*, vol. xxxvi, 89.

Williams, W. Roger (1898)—Increased Mortality from Cancer, giving the results of researches. *Statistical Journal*, vol. lxi, 560.

[An abstract of an article in the *Lancet* (date not given)—1851-96.]

2. *Diphtheria* :

Erskine, A. M. (1904)—Epidemic Diphtheria. *Public Health*, vol. xvi, 763.

[An examination of the causes favourable and unfavourable prevailing during an epidemic at Goole.]

Newsholme, A. (1898)—*Epidemic Diphtheria. A Research on the Origin and Spread of the Disease from an International Standpoint.* 196 pp., 8vo. London : Swan Sonnenschein and Co.

Smith, R. W. (1900)—*Diphtheria.* 118 pp., 8vo. London : Baillière, Tindall and Co.

3. *Insanity* :

Heron, D. (1907)—*A First Study of the Statistics of Insanity and the Inheritance of the Insane Diathesis.* 33 pp. London : Dulau and Co.

Humphreys, Noel A. (1890)—Statistics of Insanity in England, with special reference to its alleged increasing prevalence. *Statistical Journal*, vol. liii, 201.

[Examination of material : census statistics, Lunacy Commissioners' Statistics. Distribution and age-distribution of insanity.]

II. NON-OFFICIAL PUBLICATIONS—*Contd.*B. SPECIAL DISEASES—*Contd.*3. *Insanity—Contd.*

Humphreys, Noel A. (1907)—The alleged Increase of Insanity. *Statistical Journal*, vol. lxx, 203.

[Points out differences between Census figures and those of Commissioners—Increase recorded (prior to 1891-1901) at ages 45—1891-1901, at all ages. Some of increase due to accumulation by diminished asylum mortality and some to transfer to asylums from workhouses, &c.]

Mitchell, A. (1877)—Death-rates of Persons in Asylums. *Journ. of Mental Sci.*, Apr. 1879; also *Journ. Instit. Actuaries*, vol. xxviii, 432.

4. *Measles:*

Wilson, G. N. (1905)—Measles: its Prevalence and Mortality in Aberdeen. *Public Health*, vol. xviii, 65.

[A companion paper to that of Laing and Hay on whooping-cough.]

5. *Peritonitis:*

Robertson, W. (1875)—Mortality of Males and Females from Peritonitis. *Journ. Instit. Actuaries*, vol. xix, 118.

6. *Pneumonia:*

Howarth, W. J. (1907)—The Public Health Aspect of Pneumonia. *Public Health*, vol. xix, 274.

[A partial study of the mortality in the country as a whole and in Registration Counties from pneumonia and bronchitis. A consideration of the infectious character of pneumonia.]

7. *Scarlet Fever:*

Boyd, J. J. (1902)—Scarlet Fever in the County Borough of South Shields. *Public Health*, vol. xiv, 473.

[A study of the incidence (case rate) and mortality in the Borough, 1892-1901.]

8. *Smallpox:*

Burridge, A. F. (1902)—The Vaccination Act, 1898. *Journ. Instit. Actuaries*, vol. xxvii, 245.

9. *Tuberculosis:*

Dudfield, R. (1907)—Note on the Mortality from Tuberculosis, 1851-1905. *Statistical Journal*, vol. lxx, 454.

Elderton, W. P., and Perry, S. J. (1910)—*A Third Study of the Statistics of Pulmonary Tuberculosis*. 36 pp. London: Dulau and Co.

Elderton, W. P., and Perry, S. J. (1913)—*A Fourth Study of the Statistics of Pulmonary Tuberculosis*. 55 pp. London: Dulau and Co.

Goring, C. (1909)—*On the Inheritance of the Diathesis of Phthisis and Insanity*. 28 pp. London: Dulau and Co.

Hayward, T. E. (1904 ?)—On the Construction of Life-Tables and on their application to a Comparison of the Mortality from Phthisis in England and Wales during the Decennia 1881-90 and 1891-1900. Lecture at Victoria University, Manchester ("Advanced Lectures on Public Health").

Hayward, T. E. (1905)—The Mortality from Phthisis in England and Wales during 1891-1900, measured by exact Statistical Methods. *Journal of Preventive Medicine*, vol. xiii, 280 (May, 1905).

II. NON-OFFICIAL PUBLICATIONS—*Contd.*9. *Tuberculosis—Contd.*

Lyon, T. G. (1892)—Consumption in Relation to Life Assurance. *Journ. Instit. Actuaries*, vol. xxx, 120.

Manly, H. W. (1892)—An attempt to Measure the Extra Risk from a Consumptive Family History. *Journ. Instit. Actuaries*, vol. xxx, 97.

McWheeney, E. J. (1907)—Popular endeavour against Tuberculosis: its Instruments, Methods and Results. *Statistical and Social Inquiry Society of Ireland*, vol. xii, 62.

[A review of the efforts to combat this disease especially since Dr. Koch's discovery in 1882 of the Tubercle Bacillus. The Mortality from the disease is statistically studied for a series of years, and the results of Sanatorium treatment described.]

Newsholme, Arthur (1908)—*The Prevention of Tuberculosis*. 429 pp. London: Methuen and Co.

Pearson, Karl (1911)—*The Fight Against Tuberculosis, and the Death-rate from Phthisis. (Questions of the Day and of the Day, No. II.)* 35 pp. London: Dulau and Co.

Pearson, Karl (1907)—*A First Study of the Statistics of Pulmonary Tuberculosis*. 26 pp. London: Dulau and Co.

Pope, Ernest G.; Pearson, Karl; Elderton, Ethel M. (1908)—*A Second Study of the Statistics of Pulmonary Tuberculosis: Marital Infection*. 36 pp. London: Dulau and Co.

Rusher, E. A.; Kenchington, C. W. (1913)—An Investigation into the Effects of Family and Personal History upon the Rates of Mortality experienced in various Classes of Life Assurance Risks, with Special Reference to Tuberculosis. *Journ. Instit. Actuaries*, vol. xlvii (*not yet published*).

Stewart, C. Hunter, M.B. (1911)—The Sex and Age Incidence of Mortality from Pulmonary Tuberculosis in Scotland and in its Groups of Registration Districts since 1861. *Proceedings Royal Society of Edinburgh*, part 3, vol. xxxi.

[A statistical study in which, among other subjects, the influence of occupation on the prevalence of the disease is discussed.]

Symons, W. H. (1901)—Statistics concerning Consumption and other Preventible Diseases. *Public Health*, vol. xiii, 627.

[A comparison of the mortality (1881-90 and 1898) in the counties of Somerset, Gloucester and Wiltshire with that of England and Wales.]

Symons, W. H. (1902)—Distribution of Phthisis. *Public Health*, xiv, 352.

[A continuation—with more detailed figures—of the preceding article.]

10. *Whooping-cough* :

Hay, M. (1903)—Notification of Measles and Whooping-cough. *Public Health*, vol. xv, 582.

[A discussion of the utility of notification.]

II. NON-OFFICIAL PUBLICATIONS—*Contd.*10. *Whooping-cough—Contd.* ³

Laing, J. S., and Hay, M. (1902)—Whooping-cough: its Prevalence and Mortality in Aberdeen. *Public Health*, vol. xiv, 584.

[Whooping-cough was made notifiable in 1881 by Private Act of Parliament; authors discuss the incidence (season, sex and age, second attacks, &c.) and mortality during 1882-1900.]

C. OCCUPATIONAL MORBIDITY AND MORTALITY:

Barr, Thomas (1885-86)—Enquiry into the effects of Loud Sounds upon the Hearing of Boilermakers and others who work amid noisy surroundings. *Proceedings Philosophical Society, Glasgow*, vol. xvii, 223.

[This paper deals with the extent of the loss of hearing, the region of the ear affected, the course of the deafness and prevention of deafness among boilermakers and those following noisy occupations.]

Beatty, J. (1905)—The Mortality Statistics of Boot and Shoe Workers in Northampton. *Journal Royal Sanitary Institute*, vol. xxvi, 580.

[Mainly statistical.]

Bertillon, Jacques (1892)—Morbidity and Mortality according to Occupation. *Statistical Journal*, vol. lv, 559.

[Mortality in various countries, from various sources (*e.g.*, Lyons Silk Workers' Mutual Aid Society) and according to certain occupations.]

Collet, Clara E. (1898)—Collection and Utilization of Official Statistics bearing on the extent and effects of the Industrial Employment of Women. *Statistical Journal*, vol. lxi, 219.

[A study of the numbers of women employed in various trades and occupations, with comparisons of the birth and infantile mortality rates in the same Districts—mainly "Twenty-seven large towns."]

Data somewhat ancient, as Tables end 1893.]

Corbet, W. J. (1871-76)—The Statistics of Insanity, past and present. *Statistical and Social Inquiry Society of Ireland*, vol. vi, 382.

[A statistical study of the apparent increase of insanity in the United Kingdom and of the causes thereof.]

Dearden, W. F. (1910)—State Medical Supervision of Factories and Workshops. *Public Health*, vol. xxiv, 82.

[Contains tables of grounds for refusal of certificates to work and analysis of frequency of defects, &c.]

Dearden, W. F. (1911)—The Relationship of Public Health to Industrial Diseases. *Public Health*, vol. xxiv, 208.

[Outline of the need of intelligent medical supervision of the conditions of factory labour—with some statistics.]

Dunlop, J. C. (1906)—Occupation Mortalities. *Edinburgh Medical Journal*, N.S., vol. xix, 417.

[Study of mortality in various occupations in Scotland based on population of 1901 and deaths in 1900, 1901 and 1902.]

Dunlop, J. C. (1909)—Occupation Mortalities. *Trans. Faculty Actuaries*, vol. v, 1.

Foster, C. le Neve (1885)—On the Relative Dangers of Coal and Metal Mining in the United Kingdom of Great Britain and Ireland, &c. *Statistical Journal*, vol. xlviii, 277.

[A comparison between the dangers of coal and metal mining with a view to testing the accuracy of the assumption that the colliers had a far more dangerous occupation than the metal miners.]

II. NON-OFFICIAL PUBLICATIONS—*Contd.*C. OCCUPATIONAL MORBIDITY AND MORTALITY—*Contd.*

Gibson, E. (1861-63)—Employment of Women in Ireland. *Statistical and Social Inquiry Society of Ireland*, vol. iii, 138.

[A short account of what has been done in Ireland with regard to women's employment, more especially for educated women.]

Greenwood, A. (1907)—The Cotton Industry of Blackburn. *Public Health*, vol. xix, 201.

[An examination of the mortality from all causes and selected diseases prevailing (1891-1905) among the cotton operatives as a whole and by classes.]

Hancock, W. N. (1857-60)—Effects of the Employment of Women in Occupations attended with Publicity, illustrated by the Factory System at Bradford. *Statistical and Social Inquiry Society of Ireland*, vol. ii, 436.

[Deals with the drawbacks to the employment of women, especially married women in factories. Owing to the absence of the women from their homes, the children are neglected, there is waste in drink and careless housekeeping, besides other evils of a moral nature.]

Humphreys, Noel A. (1887)—Class Mortality Statistics. *Statistical Journal*, vol. 1, 255.

[Influence of improved sanitation. Discussion of Dr. Grimshaw's attempt to supplement Census reports by classifying population in Dublin.]

Hutchins, Miss B. L. (1909)—Statistics of Women's Life and Employment. *Statistical Journal*, vol. lxxii, 205.

[Subjects—excess of women over men; necessity of independent livelihood; proportions of women occupied.]

Legge, T. M. (1901)—A Discussion on the Diseases of Occupations. *British Medical Journal*, vol. ii (1901), 401.

[A discussion of certain industrial diseases with an analysis of notification returns under Section xxix of Factory and Workshop Act, 1835.]

McLaughlin, J. J. (1898)—Mortality in Certain Hazardous and Unhealthy Occupations. *Trans. Actuar. Soc. (Edin.)*, vol. iv, 335.

Ogle, William (1886)—Mortality in the Medical Profession. (Read before the Royal Medical and Chirurgical Society.) *Statistical Journal*, vol. xlix, 164.

[Death-rate in medical profession higher than in any other learned profession, and compares unfavourably with rates in most trades and industries.

Inquiry as to diseases to which this higher rate is due.]

Oliver, Thomas (1908)—*Diseases of Occupation*, xix + 427 pp. London: Methuen and Co.

Oliver, Thomas (1905)—Ankylostomiasis, or the Miner's Worm Disease. *Proceedings, Royal Society, Edinburgh*, vol. xxv, Part 2, p. 813.

[An account of the prevalence of this disease in different countries, and of the means adopted for its prevention or reduction. The anatomy and physiology of the miner's worm is described.]

Parkes, L. (1903)—The Death-rates of Working-class Communities. *Practitioner*, vol. lxx, 840.

[An inquiry into the housing and vital statistics of certain selected populations representing the working classes residing in the Borough of Chelsea.]

II. NON-OFFICIAL PUBLICATIONS—*Contd.*C. OCCUPATIONAL MORBIDITY AND MORTALITY—*Contd.*

Richardson, B. W. (1876)—Unhealthy Trades. *Journal of Society of Arts*, vol. xxiv, 122.

[Influence of physical labour on individuals and natural vitality.]

Scurfield, H. (1910)—Lung Disease among the Sheffield Grinders. *Public Health*, vol. xxiii, 113.

[An analysis of the numbers (male 18) employed 1901-08, and the mortality rates among the same from all causes, pulmonary tuberculosis and respiratory diseases.]

Tozer, William Henry (1904)—Five Years' Experience of the Effect of the Workmen's Compensation Acts, with especial reference to schemes certified thereunder. *Statistical Journal*, vol. lxvii, 228.

[Mainly financial.]

Verney, H. (1910)—On the Recent Considerable Increase in the Number of Reported Accidents in Factories. *Statistical Journal*, vol. lxxiii, 95.

[Since 1895 the number of accidents reported annually in factories has notably increased. Such increase may be explained (a) by greater stringency of Act of 1895; (b) by increased volume of trade; and (c) by more efficient reporting. The last probably the principal cause.]

Ward, Leonard (1905)—The Effect, as shown by Statistics, of British Statutory Regulations directed to the Improvement of the Hygienic Conditions of Industrial Occupations. (Howard Medal Prize Essay.) *Statistical Journal*, vol. lxviii, 435.

[Figures and charts are given showing the reductions in mortality from certain causes in selected Lancashire towns, and comparisons instituted between the anthropometry of children of factory and non-factory parents, &c.]

Warner, Francis (1893)—Results of an Inquiry as to the Physical and Mental Condition of 50,000 Children seen in 106 Schools. *Statistical Journal*, vol. lvi, 71.

[Cases arranged as follows: developmental cases; nerve cases; cases of low nutrition; and dull cases. There are a number of tables further analysing the above.]

Welton, Thomas A. (1869)—On the Classification of the People by Occupations, and on other subjects connected with Population Statistics of England. *Statistical Journal*, vol. xxxii, 271.

[Sets out the author's general principles of classification, and makes suggestions in regard to the then following Census.]

D. INFANTILE MORTALITY:

Allin, S. J. H. W. (1912)—Tables of Mortality for the Assurance of Infantile Lives. *Trans. Fifth Internat. Cong. Actuaries*, 105.

Baines, Mrs. (1868-69)—Prevention of Excessive Infant Mortality. *Manchester Statistical Society*, Session 1868-69, 1.

[Deals with excessive infant mortality generally and in Manchester and discusses methods and remedies for its reduction.]

Buchan, J. F. (1911)—Some Sociological Aspects of Infantile Mortality. *Public Health*, vol. xxiv, 221.

[A study of infantile mortality with reference to (a) size of family; (b) position of child in family; and (c) from certain causes of death.]

II. NON-OFFICIAL PUBLICATIONS—*Contd.*D. INFANTILE MORTALITY—*Contd.*

Chalmers, A. R. (1905)—Infant Mortality. *Public Health*, vol. xviii, 409.

[A summary of the changes noted in recorded rates in various parts of the country with an attempt to indicate (a) the causes producing the observed changes; and (b) the dates when such causes became operative. Charts, &c., 1850-1905.]

Divine, T. (1906)—The Prevention of Infantile Mortality. *Journal Preven. Med.*, vol. xiv, 599.

Divine, T. (1906)—The "Wasting Diseases" of the Registrar-General. *Practitioner, Lond.*, vol. lxxvii, 610.

[Discusses the question of employment of married women in relation to premature birth. Details the various causes of wasting disease in children, includes syphilis as a probable cause of some of those attributed to atrophy.]

Divine, T. (1907)—Sanitary Conditions in relation to Infant Mortality. *Lancet*, vol. i (1907), 358.

[Considers the influence of sanitation upon infant mortality; some statistics.]

Dodd, J. T. (1904)—The Causes of High Infantile Mortality. *Lancet*, vol. i (1904), 334.

[A letter with statistics suggesting that infant mortality is lower in unions giving a fair amount of out-relief than when an indoor policy is adopted.]

Drake, Barbara (1908)—Some Records of Infantile Mortality in Westminster. *Statistical Journal*, vol. lxxi, 678.

[A comparison of the mortality and health of survivors (age one year) according to various social and economical factors and maternal health, &c.]

Evans, E. (1908)—Influence of Parentage upon Infantile Mortality. *Journal Royal Sanitary Institute*, vol. xxix, 758.

[A brief *résumé* of some statistical evidence.]

Forsyth, D. (1908-09)—Infant Mortality as seen in a Children's Hospital, being an analysis of 1,202 consecutive Infant Deaths in the Evelina Hospital for Sick Children. *Proceedings Royal Society of Medicine*, vol. ii, *Section Study Diseases of Children*, 101.

[A comparison of the proportions of deaths from various causes in children under one as recorded in the Evelina Hospital with those given by the Registrar-General.]

Gaffikin, P. E. (1905)—Some Causes of Infantile Mortality. *Journal Royal Institute of Public Health*, vol. xvi, 220.

[Advocates certain reforms including notification of epidemic diarrhoea. Gives some figures relating to infantile mortality from diarrhoea in Warrington.]

Hill, T. E. (1905)—Infant Mortality. *Public Health*, vol. xvii, 623.

[A comparison of mortality in the administrative County of Durham with that of England and Wales.]

Hutchins, Miss B. L. (1908)—Note on the Mortality of Young Children. *Statistical Journal*, vol. lxxi, 174.

[An examination of the mortality in the first five years of life in certain districts by ages and by causes based on the Decennial Supplement for 1891-1900.]

II. NON-OFFICIAL PUBLICATIONS—*Contd.*D. INFANTILE MORTALITY—*Contd.*

Jones, Hugh R. (1894)—Perils and Protection of Infant Life. (Howard Medal Prize Essay.) *Statistical Journal*, vol. lvii, 1

[History of legislation for protection of infants, and examination of the death-rate of children under five from all causes. Suggested remedies and tables.]

Lapage, G. P. (1910)—Contribution to the Study of Infantile Mortality. *Medical Chron., Manchester*, vol. lii, 15.

[Occupations of women the most potent causes.]

Mackenzie, J. M. (1909)—Certain Aspects of Infant Mortality in Mining Districts. *Journal Royal Institute Public Health*, vol. xvii, 349.

[Shows unsuitable surroundings of child life that exist in mining districts especially during the early years after opening a mine, and the consequent effect upon mortality statistics.]

Moore, S. G. H. (1906)—Infantile Mortality. *Journal Prevent. Medicine*, vol. xiv, 19.

[In houses having more than five rooms in Croydon, 945 per 1,000 infants born survive for 12 months, states that in 95 per cent. of births disease is absent, and argues therefrom that every effort should be made to save infant life.]

Newman, G. (1906)—*Infant Mortality: a Social Problem*. 356 pp., 8vo. London: Methuen and Co.

Newsholme, A. (1905)—Infantile Mortality: a Statistical Study from the public health standpoint. *Practitioner, Lond.*, vol. lxxv, 489.

[Infant Mortality of the Country as a whole is stationary, concludes that the stationary infant death-rate may indicate the existence and operation of important factors tending to lower the infant death-rate.]

Rhodes, J. M. (1904)—The Causes of High Infantile Mortality. *Lancet*, vol. i, 462.

[Argues (with statistics) that employment of women is the important factor.]

Schooling, F. (1906)—Notes on Industrial Assurance in the United Kingdom, with particular reference to Child Life Assurance. *Trans. 17th Internat. Cong. Actuaries*, 97.

Tatham, J. (1903)—Infantile Mortality. *Public Health*, vol. xvi, 42.

[An analysis of the mortality in England and Wales at ages 0-1 during 1891-1900

(a) by sex and ages (0-3, 3-6, 6-12 months). England and Wales, London, Provinces.

(b) by causes and sex—England and Wales.

(c) —————Registration Counties.]

Thompson, W. J. (1905)—Infantile Mortality. *Dublin Journal Medical Science*, vol. lxx, 461.

[States that improper artificial feeding is most important factor in high death-rate of infants.]

In the following books, communications, &c., morbidity and mortality are considered from an actuarial point of view :—

Twenty Offices' Experience: Mortality Experience of Life Assurance Companies up to 1863 collected by the Institute of Actuaries (Males and Females: Healthy and Diseased Lives).

Unadjusted data published 1869. London: C. and E. Layton, 8vo., 282 pp.

Adjusted tables published 1872. London: C. and E. Layton, 8vo. (xcix + 257 pp.).

Select Life-Tables by T. B. Sprague [1896]. London: C. and E. Layton, 8vo. (xvi + 153 pp.).

[An analysis of Healthy Males Experience of the Institute of Actuaries according to time elapsed since entry under observation.]

British Offices' Combined Experience of Assured Lives and Annuity-tants, 1863-93:

Unadjusted Data:

Life Annuity-tants [1899]. London: C. and E. Layton, 8vo. (viii + 215 pp.).

Assured Males (Whole Life Assurances) [1900]. London: C. and E. Layton, 8vo (ix + 523 pp.).

Assured Females (Whole Life Assurances) [1900]. London: C. and E. Layton, 8vo. (ix + 159 pp.).

Assured Males (Endowment Assurances, &c.). London: C. and E. Layton, 8vo. (xii + 219 pp.).

Account of the principles and methods adopted in the compilation of the Data, graduation of the Experience and construction of the deduced tables [1903]. London: C. and E. Layton (xv + 205 pp.).

Graduated Tables:

Male and Female Annuity-tants [1903]. London: C. and E. Layton, 8vo., 233 pp.

Male (Participating) Assured Lives (Aggregate) [1902]. London: C. and E. Layton, 8vo., 275 pp.

Male (Participating and Non-Participating) Assured Lives (Select) [1907]. London: C. and E. Layton, 8vo. (xiv + 432 pp.).

Aekland, T. G. (1902)—Investigations of the Rates of Mortality in different classes of the Assurance Experience. *Journ. Instit. Actuaries*, vol. xxxvii, 113.

Aekland, T. G. (1907)—Notes on the British Offices' Life Annuity Tables. *Trans. Faculty Actuaries*, vol. iii, 285.

Buchanan, J. (1908)—The Improvement in Vitality as Disclosed in the British Offices' Experience. *Trans. Faculty Actuaries*, vol. iv, 71.

Elderton, W. Palin (1903)—Temporary Assurances. *Journ. Instit. Actuaries*, vol. xxxvii, 501.

Elderton, W. Palin (1906)—On a Form of Spurious Selection which may arise when Mortality Tables are amalgamated: applied to the British Offices' Whole Life Select Table. *Journ. Instit. Actuaries*, vol. xl, 221.

Hardy, G. F. (1881)—Mortality observed amongst various Classes of Bonus Policies (British Empire Mutual's Experience). *Journ. Instit. Actuaries*, vol. xxiii, 1.

Hardy, G. F. (1904)—Memorandum on the Graduation of the Whole Life Without Profit Mortality Table (Male Lives). *Journ. Instit. Actuaries*, vol. xxxviii, 501.

Kenchington, C. W. (1909)—On the Mortality of Female Assured Lives with Graduated Tables, deduced from the British Offices' Experience. *Journ. Instit. Actuaries*, vol. xlv, 105.

Abstainers :

Moore, R. M. (1903)—Comparative Mortality among assured Lives of Abstainers and Non-Abstainers. *Journ. Instit. Actuaries*, vol. xxxviii, 213.

Aged Lives :

Richmond, G. W. (1909)—Eligibility of Aged Lives for Life Assurance. *Trans. Faculty Actuaries*, vol. iv, 265.

Assured Lives :

Burn, J.; Sharman, W. C. (1912)—Changes in the Rates of Mortality amongst Assured Lives during the past Century. *Trans. 17th Internat. Congr. Actuaries*, 527.

Manly, H. W. (1912)—A Comparison between the Mortality Experience of the Equitable Life Assurance Society at the Beginning and at the End of the XIXth Century. *Trans. 17th Internat. Congr. Actuaries*, 557.

Bankers :

Hewat, A.; Chatham, J. (1894)—Mortality Experience of Scottish Bankers. *Journ. Instit. Actuaries*, vol. xxxi, 428.

Clergy :

Hodgson, J. (1865)—*Observations on the Duration of Life among the Clergy of England and Wales*. London: C. and E. Layton. 8vo., pp. 70.

Wyatt, F. B. (1891)—*Clergy Mutual Assurance Society: Mortality Experience, 1829-87*. London: The Society. 4to., pp. 56.

Female Lives :

Kenchington, C. W. (1909)—Mortality of Female Assured Lives (British Offices' Experience). *Journ. Instit. Actuaries*, vol. xlv, 105.

Sprague, T. B. (1894)—Experience of the Scottish Equitable Life Assurance Society. *Journ. Instit. Actuaries*, vol. xxxi, 205.

Friendly Societies' Experience :

Hearts of Oak (Euston Road, London, N.W.). *Annual Valuations, 1880-1911*.

Neison, F. G. P. (1882)—*The rates of mortality and sickness according to the experience, for the five years 1871-75, of the Ancient Order of Foresters' Friendly Society*. 217 pp. London: Harrison and Sons.

Neison, F. G. P. (1889)—*The rates of mortality and sickness according to the experience of the ten years 1878-87 of the Independent Order of Rechabites (Salford Unity) Friendly Society*. 96 pp. Manchester: Richardson Campbell, 32, Lancaster Avenue, Fennel Street.

Friendly Societies' Experience—Contd.

Neison, Francis G. P. (1877)—Some Statistics of the Affiliated Orders of Friendly Societies (Odd Fellows and Foresters). *Statistical Journal*, vol. xl, 42.

[The paper deals only with statistical aspect of affiliated orders, showing progress in each case.]

Rational Association (Bridge Street, Manchester). *Quinquennial Valuations*, 1896 ; 1901 ; 1906.

Snow, E. C. (1913)—Some Statistical Problems suggested by the Sickness and Mortality Data of certain of the large Friendly Societies. *Statistical Journal*, vol. lxxvi, 445.

[A discussion of the variations in the amounts of sickness and mortality experienced in different parts of the United Kingdom.]

Sutton, W. (1896)—*Sickness and Mortality Experience deduced from the Quinquennial Returns made by Registered Friendly Societies for the year 1856-80*. Reprinted 1912. 133 pp. H.M. Stationery Office.

Watson, Alfred W. (1903)—*Independent Order of Oddfellows, Manchester Unity Friendly Society. An Account of an Investigation of the Sickness and Mortality Experience of the I.O.O.F., Manchester Unity, during the five years 1893-97*. xv + 489 pp., 8vo. Manchester: The Manchester Unity.

Life Tenants :

Campbell, N. (1902)—Investigation of Experience. *Trans. Faculty Actuaries*, vol. i, 91.

Liquor Trade :

Barrand, A. R. (1900)—Mortality Experience of Assured Lives in Hazardous Occupations (Publicans). *Trans. IIIrd Internat. Congr. Actuaries*, 446.

Douglas, G. (1888)—Mortality Experience among Assured Lives engaged in Liquor Traffic. *Trans. Actuar. Soc. (Edin.)*, vol. ii, 205.

Low, G. M. (1897)—Extra Risk : Some Particulars of a recent Investigation of the Mortality of Persons engaged in the Sale of Intoxicating Liquors. *Trans. Actuar. Soc. (Edin.)*, vol. iv, 115.

McDonald, J. (1906)—Mortality among Persons engaged in Liquor Trade. *Trans. 17th Internat. Congr. Actuaries*, 517.

Stott, J. (1876)—Mortality of Innkeepers, &c. (Experience of the Scottish Amicable Life Ass. Soc. 1826-76). *Journ. Instit. Actuaries*, vol. xx, 35.

Wallace, J. (1887)—Mortality among Liquor Sellers. *Trans. Actuar. Soc. (Edin.)*, vol. ii, 173.

Mariners :

Ryan, G. H. (1887)—Mortality Experience of the Marine and General Mutual Life Assur. Society in respect of the Lives of Mariners (1852-79). *Journ. Instit. Actuaries*, vol. xxvi, 413.

Miners :

Strachan, T. Y. ; Todhunter, R. (1902)—*Report on the Northumberland and Durham Miners' Permanent Relief Fund*, 1901. Newcastle : J. Beall. 8vo., pp. 35.

Peerage :

- Hart, J. R. (1894)—Investigation of the Mortality of Married Females of the Peerage. *Trans. Actuar. Soc. (Edin.)*, vol. iv, 33.
- Hunter, R. M. (1912)—Peerage, Males: Statistics of Mortality, etc. *Trans. Faculty Actuaries*, vol. vi, 355.
- Lees, M. M. (1903)—Investigation to show Rates of Mortality and Marriage among the Daughters of Peers and Heirs Apparent. *Trans. Faculty Actuaries*, vol. i, 257.

Pension and Widows' Funds :

- Burn, J. ; McDonald, J. (1904)—Rates of Re-marriage and Mortality amongst Widows in receipt of Relief from the Patriotic (Russian War) Fund, 1854-1900. *Journ. Instit. Actuaries*, vol. xxxviii, 433.
- Hewat, A. (1912)—*Widows' and Pension Funds : Scottish Bankers', Schoolmasters', Clergymen's, Advocates' and Peerage Families*. Revised Edition. Edinburgh: T. and A. Constable. 8vo., pp. 35.
- Hewat, A. ; Chatham, J. (1894)—Mortality and Marriage Experience of Widows' Funds of Scottish Bankers. *Journ. Instit. Actuaries*, vol. xxxi, 428.
- Huie, D. R. W. (1868)—*Valuation of Widows' Funds : (Ministers' Widows' Fund)*. Edinburgh: R. Grant and Son. 8vo., pp. viii + 80.
- King, G. (1897)—Rate of Mortality amongst the Female Nominees of the General Annuity Trust Fund (1869-95). *Journ. Instit. Actuaries*, vol. xxxiii, 262.
- King, G. (1908)—*Elementary School Teachers' Deferred Annuity Fund*: Report to the Board of Education of the Mortality Experience of the First Septennium. [H.C. 11—1908.]

Reversionary Annuities :

- Cumming, S. F. M. (1906)—Notes on Mortality Experience in connection with Reversionary Annuity Business in Great Britain. *Trans. 17th Internat. Congr. Actuaries*, 357.
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ON THE INCREASE OF MORTALITY FROM "INJURY AT BIRTH."

By R. DUDFIELD, M.A., M.B.

AN examination of the numbers of deaths in England and Wales during the twenty years 1891-1910, certified to have been due to "injury at birth," has given results which appear to be of sufficient interest to warrant their submission to the Fellows of the Society. The results are submitted without any discussion of the causes of the increase, as that is a subject more suitable to a medical gathering.

In 1891, 50 deaths were entered as due to injury at birth, in 1910, 846. The increase has been an almost continuous one since 1895, as the appended figures show.

Deaths from injury at birth.

1891.....	50	1896.....	178	1901.....	603	1906.....	866
'92.....	73	'97.....	166	'02.....	651	'07.....	816
'93.....	128	'98.....	162	'03.....	689	'08.....	942
'94.....	120	'99.....	333	'04.....	772	'09.....	956
'95.....	134	1900.....	448	'05.....	709	1910.....	846
Averages	101		257		685		885

The average for the last quinquennium (885) represents an increase of 776 per cent. over that of the first (101).

Deaths from "injury at birth" occur, almost invariably, during the first weeks of life, and mortality rates should therefore be based on the number of births registered. The average mortality for each quinquennium has been calculated.

Mortality per 1,000 births.

1891-95	0.11	1896-1900....	0.27	1901-05	0.72	1906-10	0.96
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It is well known that the total rate of mortality at ages under 1 year has notably decreased within recent years. It will be of interest, therefore, to see what change has taken place in the ratio of deaths from this cause to all deaths—at ages under 1 year.

Ratios per 100,000 deaths.

1891-95....	73	1896-1900....	178	1901-05	529	1906-10	820
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The increases both in the mortality and in the ratio to all deaths are shown very clearly by the index-numbers.

Index numbers.

	Mortality.	Ratio injury at birth: all deaths (0-1).
1891-95	100	100
'96-1900	215	244
1901-05	654	725
'06-10	873	1,123

The problem of securing a reduction in infantile mortality as some compensation for the low birth-rate is receiving a considerable amount of attention from experts and the public generally. The figures given here *appear* to indicate an avoidable wastage of life—small perhaps at present, but rapidly increasing—the prevention of which ought to be comparatively easy.

It may be urged that the figures are not comparable throughout the series, and that such lack of comparability is evidenced by the sudden increases to be observed in 1893 (75 per cent. increase above the number recorded in 1892), and in 1899 (105 per cent. increase). If, however, changes in the methods of classification were made in those (or any other) years, there still remain the considerable increases which took place during the periods which elapsed between the makings of such changes. It will require some ingenuity to explain away the very great increase in mortality from this one cause—a cause which ought not to be operative except in very rare instances.

[Dr. Dudfield's communication was referred by the Editors to Dr. T. H. C. Stevenson, of the General Register Office, who adds the following note, viz. :—

"Changes made in the rule of classification about the beginning of the century render it impossible usefully to compare the records of years prior to 1899 with those subsequent to 1900 on this point. As the figures themselves suggest, these changes came into operation gradually during the years 1899-1901. They chiefly consisted in the transference of deaths ascribed to malpresentation from the heading 'other ill-defined causes' to 'injury at birth.'

"The above criticism does not apply to the considerable increase pointed out by Dr. Dudfield since 1901, especially when the deaths from this cause are compared, as they should be, with the numbers of births giving an opportunity for their occurrence; and I am unable to offer any explanation of the increase in the figures except increase in the number of deaths so returned in certification."]

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*Theorie und Methoden der Statistik*. Von Al. Kaufmann. v + 540 pp., roy. 8vo. Tübingen: J. C. B. Mohr. Price 16 marks.

From the preface by the author, who is Professor of Statistics at the Frauenhochschule and Handelshochschule of St. Petersburg, it appears that this is a translation of his work which originally was published in the Russian language. At the same time the opportunity of translation has been taken to recast and revise some portions of the book, and to introduce more illustrations and examples from fields other than those of Russian practice.

The work is divided into two portions: "The theoretical foundations of the statistical method" and "The practice of social statistics." The first, written, broadly speaking, from the standpoint of Lexis, deals with such matters as the sphere of application of the statistical method, the law of large numbers, the dispersion and stability of statistical series, statistical reasoning and its relation to induction. In the second, the author turns to the practical methods of collecting statistics; the sources of error and the trustworthiness of the data; incomplete or sampling methods; tables, percentages, means, &c., and graphic methods.

In the first part, the author has attempted to give a fairly detailed account of the matters dealt with, comprehensible to the non-mathematical reader. In this somewhat difficult attempt, he has, we think, been fairly successful, but only the non-mathematical reader himself is competent to form a decisive judgment. On some points the explanations as to the conditions assumed seem to the reviewer inadequate. This is notably the case with the theorem respecting the probability of an event, which has succeeded n times without intermission, succeeding at the next trial, and its allies. These are simply stated (pp. 59—60) with a few illustrations, but no hint is given of the method of deduction or the hypotheses on which they are based, and it must be very doubtful how far such half-comprehended statements will be of service. The incidental statement

that the chance of drawing from the pack 13 cards of the same colour is $(\frac{1}{52})^{13}$ needs some emendation as well as explanation (p. 52). On p. 70 the reader may be somewhat confused by finding the "mean error" correctly defined in the text as the square-root of the arithmetic mean of the squares of the deviations, but given in the formula with a $2\Sigma(\delta^2)$ in the numerator. The same confusion of the term "mittlere Fehler" with the empirical modulus occurs on p. 75. On p. 483, where the definitions are given once more, the nomenclature is again hardly clear. The formula for the mean error is correctly given, but the author a few lines lower remarks that "the mean error (in the form $\sqrt{2\Sigma(\delta)^2/n}$) in the case of normal dispersion agrees with the modulus." It would surely be clearer to say that the mean error multiplied by $\sqrt{2}$ agrees with the theoretical or combinatorial modulus.

The chief interest of the book to the English reader will lie, we think, in the illustrations of Russian practice in the second part. To some, perhaps, the official use of sampling methods in the author's country will especially appeal (p. 363). Professor Kaufmann himself in 1887-90 had to carry out personally an enquiry into the condition of the peasantry in a district of Siberia. About one-fifth to one-fourth of the villages in each sub-district were subjected to a census, being chosen so as to be as evenly distributed over it as possible: where any portions of a sub-district differed notably in respect, say, of the agricultural conditions, or the occupations, a number of villages were taken in each such portion. The author discusses the admissibility and criterion for the trustworthiness of such "representative" counts, with especial reference to Dr. Bowley's views, and pleads that, owing to the heterogeneity of the aggregate to be observed, the absolute number of the sample is not a sufficient criterion of the trustworthiness, but its proportion to the whole must be taken into account as well. In a sample that is very small relatively to the whole the rarer cases will either not be represented at all or will occur only in very inadequate numbers, and all detail, all the light and shade of the picture, will be lost.

The author's views in reference to mathematical methods are stated with some frequency and emphasised to an extent which seems a little out of place in the text of, as distinct from the Preface or Introduction to, a treatise. That many statisticians are not mathematically expert, and that a book which presupposes very little mathematical knowledge may serve a useful purpose is indisputable. But to attempt, as the author seems to us to attempt, to draw a definite line and to say that methods below that line are non-mathematical and useful, methods above it are "mathematical," of interest only to the mathematician by profession, and of more theoretical than practical value, seems to the reviewer absurd. All statistical methods, *i.e.* methods of handling statistics, are more or less mathematical, and the only question is how far one can go in addressing a given audience. Professor Kaufmann has himself adopted a course hardly consistent with his own expressed views when, in Part I of his book, he has devoted so much space to a mathematical discussion of dispersion, inadequate in so far as he

has compelled himself to assume little mathematical knowledge on the part of his readers, and his views as to the value of English writings do not seem (judging from the references given) to be founded on adequate knowledge.

He ventures to support these views by a quotation from von Bortkewitsch. But von Bortkewitsch neither goes so far as the author, nor does the passage cited have much bearing on the great bulk of recent English work. When Professor Kaufmann says that such methods as those recently developed in this country can only be understood by the "Fachmathematiker," one can only recollect with astonishment the students of social statistics, the medical men and the biologists—hardly Fachmathematiker—who have succeeded in mastering them, and judged their value sufficient to justify the effort.

G.U.Y.

2.—*Die Grundlagen der Schifffahrtsstatistik.* Von Dr. Walther Vogel. (Veröffentlichungen des Instituts für Meereskunde an der Universität Berlin.) x + 154 pp., 8vo. Berlin: Ernst Siegfried, Mittler und Sohn, 1911.

This interesting volume originated with the preparation, for the Museum für Meereskunde at Berlin, of charts showing the development of the German mercantile marine and the movement of shipping at German ports. In order to render these charts, some of which are here reproduced, more intelligible and at the same time to guard, so far as possible, against their misuse, it was thought desirable to prepare a statement as to the bases of shipping statistics, and the result is the volume before us.

It falls into four parts: the first (pp. 1-43) deals with the history of the measurement of ships, and gives a critical account of the various units of measurement; the second (pp. 44-80) provides a description of the materials used in the compilation of shipping statistics and of the modes of collection, and a list of the various national departments concerned therewith, as well as of the "classification" authorities (Bureau Veritas, Lloyds', &c.) which publish such statistics of their own; the third (pp. 81-126) discusses the difficulties in the way of the preparation of satisfactory international comparisons owing to the diversity of systems of measurement and bases of national statistics; and the last part (pp. 127-167) is devoted to a survey (illustrated by the charts above-mentioned and numerous graphs) of the growth of the German mercantile marine and carrying trade from 1874 to 1910. There is a useful short bibliography and, in a slip at the end, a collection of the model forms, &c., in use in Germany.

In the historical sketch there are three points of special interest. One is the manner in which British legislation with respect to the measurement of ships has been accepted as a model by the principal maritime Powers—a fact which led the majority of the Board of Trade Committee of 1906 to regard as altogether undesirable any further change which could not be shown to be absolutely necessary. The principal exceptions are furnished by the administrations of the Suez Canal and the Danube, and by Sweden. A second is the

constant trend towards increased deductions from gross tonnage in respect of propelling power, &c., a tendency which has in some cases undoubtedly resulted in a registered tonnage which is disproportionately low in relation to gross tonnage, and has had an adverse effect upon the revenues of port authorities, whose dues are usually based on net tonnage taken as the best approximate indication of carrying capacity and consequently of earning power. (There is an interesting account of the various efforts made in France to cope with the difficulties caused by the fact that the shipping bounties are given on *gross* tonnage, shipowners being thereby encouraged to build the largest possible vessels; whilst port dues are levied on *net* tonnage, which shipowners are consequently desirous of reducing to a minimum.) Thirdly, there is the change in carrying capacity relative to net tonnage. In respect of the second and third of these matters, much use is made by Dr. Vogel of the Report of the Board of Trade Committee of 1906 and the report prepared in 1909 for the Liverpool Steamship Owners' Association. Following the example of the latter report, the author has endeavoured to frame comparative statistics of the net tonnage and total carrying capacity of the German mercantile marine—a task complicated by the change in the system of measurement introduced by the German law of 1895. The results of Dr. Vogel's calculations are summarised in the following table:—

	1890.			1910.		
	Gross tonnage.	Net tonnage.	Estimated carrying capacity.	Gross tonnage.	Net tonnage.	Estimated carrying capacity.
	R.T.	R.T.	Tons.			
Steamships	930,061	617,911	961,360	3,865,276	2,349,557	5,104,400
Sailing vessels (including lighters)	750,634	702,810	1,054,210	564,951	509,674	764,510
Total.....	1,689,095	1,320,721	2,015,570	4,430,227	2,859,231	5,868,910

Thus, in twenty years, the gross tonnage of German merchant shipping increased by 162 per cent., net tonnage by 117 per cent., and carrying capacity by 192 per cent. In respect of carrying capacity, however, deductions have to be made on account of coal and fresh water supplies. When an estimated allowance is made for these, the increase in carrying capacity is 430 per cent. in the case of the steamships, and 180 per cent. for the whole merchant fleet. In a further section Dr. Vogel endeavours to estimate the change in transport power by taking speed into account and calculating what he calls "ton sea-miles"; and on this basis he obtains an increase, as regards net tonnage and speed combined, of 315 per cent. This is, of course, due in some measure to the displacement of sailing vessels by steamships.

The main conclusion at which Dr. Vogel arrives, and for which he appears to make out a good case, is that, for purposes of

comparative statistics, both over a series of years and as between one nation and another, the only satisfactory basis is that of carrying capacity. Whether that conclusion gains general acceptance or not—and there are admittedly great difficulties in the way of its practical application—we are at least indebted to Dr. Vogel for a very useful and suggestive study. P.A.

3.—*Report to the Board of Agriculture and Fisheries of an Enquiry into Agricultural Credit and Agricultural Co-operation in Germany.* By J. R. Cahill. [Cd. 6626.] xxxvi + 302 + 226 pp., fol. London: Wyman and Sons, 1913. Price 5s.

Mr. Cahill, who was commissioned by the Board of Agriculture to enquire into the different forms of Agricultural Co-operation in Germany, has fulfilled his task very thoroughly, and has presented a report which will be of the greatest value to all interested in the subject. He has obtained his facts and statistics not only from published reports but by detailed local enquiry, and one of the most useful features of the blue book consists of translations of the more important laws dealing with co-operation, model articles and rules of societies of different kinds, and notes on the actual working of individual societies. It also contains two useful maps showing for the different parts of the German Empire: (1) The percentage of total cultivated area occupied in holdings of 50 acres and under; (2) the percentage of total cultivated area cultivated by the owner. For the Empire as a whole it is stated that 86 per cent. of the total cultivated area is cultivated by the owners themselves, and that 48 per cent. of the cultivated area is held in holdings of not more than 50 acres each, two broad facts which show how greatly Germany differs from this country in the matter of the tenure of land.

The report deals with all the different forms of agricultural co-operation in which Germany has taken a lead, such as Co-operative Societies for the supply of agricultural requisites, for the sale of milk products, for the improvement of breeds of cattle, for the selling of corn, cattle and eggs, and for the supply of machinery and electricity; but the greater part of the report is taken up with an account of the different ways in which co-operation has brought cheap credit within the reach of all classes of agriculturists. The most striking development in this direction has been that of the local Co-operative Credit Societies, which provide short term credit mainly on personal security. These rural banks now amount to about 17,000 in number, with a membership of over 1,500,000 persons, most of whom are heads of households. The magnitude of their transactions is shown by the fact that in 1910 their total turn-over exceeded 260,000,000*l.*, and that at the end of the year the loans outstanding amounted to 93,000,000*l.*, while at the same date the savings deposits came to a total of over 92,000,000*l.*, and the deposits on current account to nearly 11,000,000*l.* The most numerous credit societies are those based on the Raiffeisen principles of limitation of area, unlimited liability of the members, loans only to members for provident or productive purposes,

absence of profit-seeking, indivisibility of the reserve fund, gratuitous services of most of the office-holders, and promotion of the moral as well as the material advancement of members. The Raiffeisen Model Rules contain the following notable sentences:—"The Association aims less at realising profits from its business than at strengthening those economically weak, and at promoting the intellectual and moral welfare of its members. Its activities must accordingly extend to (a) furtherance of thrift; (b) the accumulation of an indivisible Association fund for the promotion of the economic conditions of the members; (c) the organisation of means for the cultivation of rural social welfare and of love of home."

"The Association rests upon a Christian and patriotic foundation. At meetings and in all the activities of the Association, opinions and measures of a religious or political character are absolutely prohibited."

Great as have been the economic advantages conferred upon the German peasantry by the co-operative movement, started more than sixty years ago by the humble Burgomaster, they are perhaps of less real importance than the improvement in their mental development and moral character, which has resulted from the practice of co-operative methods and the spread of the co-operative spirit. Mr. Cahill mentions some reasons why co-operative credit has made so little progress in England as compared with its remarkable history in Germany. In this country the number of small agriculturists who find it difficult to obtain reasonable credit is comparatively small; still smaller is the number of those who own rights in the land which they can offer as an ultimate security for loans advanced to them. Comparatively few of them are burdened with a load of debt at usurious rates of interest, such as aroused Raiffeisen's sympathy and indignation. With the exception of Scotland, England is better supplied with banks than any other country in the world, there being here a banking office for every 6,000 of the population; and those banks are prepared to advance loans even of small amount on good security, and at a fair rate of interest. But perhaps the chief obstacle to the spread of co-operative credit in this country is the independent character of the agricultural classes, which makes it difficult for them to combine for the common good, and especially to apply for loans, one of the conditions of which is that they must disclose their affairs to a committee of their fellows and submit to a certain amount of supervision and control. Notwithstanding all this, there are a considerable number of small men living on the land whose needs are not met by the present banking system, and who would undoubtedly be greatly benefited if they would only consent to follow the example of their German neighbours and combine their credit for the purpose of obtaining small loans at a moderate rate of interest; and it is to be hoped that the efforts now being made by various bodies to propagate co-operative credit societies in the villages of England and Wales may meet with success.

Another striking difference between the circumstances of land credit in Germany and in this country is that there mortgage or

long-term credit is provided on an enormous scale by different agencies, generally managed more or less on co-operative principles, and, to some extent, under the supervision and control of the State. Among these are the savings banks which, unlike our own Post Office Savings Banks, are not entirely State institutions collecting savings all over the country and utilising them only for the general financial purposes of the Government, but are managed and guaranteed by local authorities, so that each of them not only acts as a deposit bank for the savings of the locality, but utilises those savings for the advantage of the locality itself, thus providing farmers with a public mortgage credit institution in their immediate vicinity, and supplying them with mortgage loans at 5 per cent. or less. The amount invested in rural mortgages by these local savings banks is estimated at 170,000,000*l.* A similar sum is lent on the mortgage of landed properties by the Land Mortgage Credit Associations, which obtain funds mainly by the issue of land mortgage bonds. A landowner can ordinarily borrow from such an Association up to half the value of his estate at $3\frac{1}{2}$ per cent., receiving his loan in the form of bonds which are saleable in the open market. The great advantage of the system over that prevalent in this country is that, unlike the English landowner, who has usually to provide an individual mortgage security of very limited currency, and is subject to a demand for repayment of the whole loan under a threat of foreclosure or a change in the rate of interest charged, on short notice, the German landowner receives a loan which is not subject to recall at the will of the lender, but is repayable by fixed annual payments which include contributions to a sinking fund, and so long as the borrower pays these annual instalments punctually, he is secure against any action that might be taken by the lender to compel repayment of the capital sum. As Mr. Cahill points out, this organisation of mortgage credit in Germany has been greatly facilitated by the complete system of registration of title in land in force there, and it would seem to be almost impossible to organise a similar system in this country until the registration of title has been made compulsory, as it has practically been made not only in Germany, but in Austria-Hungary, Russia, several provinces of India, and some of our own Colonies. Perhaps in Scotland, where the registration of all deeds affecting the rights in the land has long been compulsory, it might be possible for landowners, if they would only agree to combine, to devise a system of Land Mortgage Credit Associations which would confer on them the great benefits which the German landowners have derived from such institutions.

J.W.

4.—*Indian Currency and Finance.* By J. M. Keynes, Fellow of King's College, Cambridge. viii + 263 pp., 8vo. London: Macmillan & Co., 1913. Price 6*s.* net.

It will not be denied by anyone who has studied the growth and triumph of the gold exchange standard in India during the last thirteen years that the criticisms which have been made in the Press and elsewhere are frequently based on a somewhat superficial

knowledge of India's monetary system. There is also the fact that those who study the financial questions of India are apt to regard them exclusively either from an Indian or from an English point of view. The true sense of perspective and the value of foreign experience are then lost. Mr. Keynes has realised this, and has produced a most instructive and readable book dealing in the course of eight chapters with the present position of the rupee, the gold exchange standard, the paper currency, a gold currency for India, council bills, cash balances, Indian banking, and the Indian rate of discount.

In the first two chapters, the gold exchange standard as a system of currency is explained. It may be said to exist when gold is not in circulation to any great extent in the country, when the local currency is not necessarily redeemable in gold, and when the Government or its agency (a Central Bank) makes arrangements for the provision of foreign remittances in gold at a fixed maximum rate in terms of the local currency. The gold exchange standard is in effect the system prevailing to-day in Holland, Austro-Hungary, Mexico, Panama, the Philippines, Java, the Straits Settlements, Siam, and of course in India. In Russia and in Japan the currency system is, in practice, really a gold exchange standard. The point which Mr. Keynes rightly emphasizes is that a currency, as Ricardo said, is in its most perfect state when it consists of cheap material, but of an equal value with the gold it professes to represent, and so long as gold is always available for *international* payments at an approximately constant rate in terms of the national or local currency, it is a matter of comparative indifference whether it forms the *local* currency. During the last thirteen years many millions of pounds sterling have been saved to India by the adoption of this system. We may, perhaps, put the beginning of the system about the years 1900-04. By 1905 the system was working well, and after the crisis and famine of 1908 it had completely triumphed.

Chapter IV is, if one may say so, the most able of the whole book, although it is the one with which we are least in agreement. In this chapter Mr. Keynes discusses the present position of gold in India and the proposals for a gold currency. It is true that a gold currency in India is unnecessary for the maintenance of exchange; it is also true that when exchange falls the gold that is required for export is not obtained from circulation or the pockets of the people, but from central reserves. But if the people of India should demand a gold mint or currency, they are surely entitled to it as any other people in the world. If a gold mint is demanded, then is there any harm of trying an experiment by which anybody who wants gold *coin* can get it from the Bombay mint by bringing *bullion*? If he does not want the gold he will bring no *bullion*. The open mint for gold is merely a *ballon d'essai*. Would not the open mint for gold attract jewellery and other hoards from their hiding-places, especially in times of famine? The cost of the proposal would probably not be greater than that of a branch mint, which, according to the last Mint Report, is about 15,000*l.* a year. The gold mint is, in short, purely an experiment which is worth attempting.

"The argument," said the Finance Minister in introducing the Financial Statement for 1913-14, "that, in point of fact, we can get by importation as much gold as we can use, is true, but it is incomplete. For one thing, India itself produces an amount of gold which is not inconsiderable. At present this goes to London, and it may continue to do so; but it is reasonable, and it may prove economical, that facilities should be given for coining it in this country if at any time the producers find their advantage in that alternative. Again, there is a large quantity of gold bullion in the country. . . . But if there is a feeling that India, after all, is entitled to its own mints, and that those mints should be empowered to turn out any coins that India required, can anyone say that the feeling is in any sense unreasonable?"

In dealing with the paper currency, Mr. Keynes makes an important suggestion as to the manner in which the reserve should be kept. He believes the reserve is needlessly restricted. "It might be proper to prescribe by law the holding of a certain proportion of the reserve (say, one-third) in gold and silver coin. A further amount might be held, as at present, permanently invested in Government of India securities. With regard to the rest, the Government should, I think, permit itself much greater latitude. It should be free to lend it out on suitable security, either in India or London, for periods not exceeding three months" (p. 59). It has sometimes been suggested that currency notes without a bullion backbone should be issued when there is great stringency in the market to the banks, preferably a central bank, on payment of a premium of 5 or 6 per cent., or a rate somewhat less than the bank rates. In India, money is forced up country to finance the harvests at a time when Government balances are highest and money dearest. What seems to be wanted is some plan by which the supply of currency may be temporarily increased when the demand for it is greatest, so that the rates may fluctuate with less severity when this up-country drain from the ports takes place. In the chapter on reserves and cash balances, the question which the author asks is—Are the reserves adequate to fulfil their purpose? The sterling reserves should not be regarded as if they were watertight compartments, and in estimating their amount the question arises whether they should be considered as currency or also as banking reserves. If for the former purpose Mr. Keynes thinks a total of 60 crores of rupees, or 40l. millions, sufficient. If for the second purpose 40l. millions should be taken only as the aggregate sterling reserve of the gold standard reserve and the sterling branch of the paper currency reserve. On p. 174, the author believes there are no advantages in keeping Indian gold in India. The experience of the years 1907-08 proves, we think, that the keeping of a supply of gold ready for export had a stimulating effect on the Indian money market.

The last two chapters of the book, which deal with Indian banking, are of exceptional interest, especially when read in conjunction with Cooke's *Banking in India* (a book long since out of print), Brunyate's *History of the Presidency Banks*, and the papers on

a Central Bank published in the *Gazette of India* in 1901. Mr. Keynes draws attention to one of the most disquieting features of Indian banking. The cash balances of the Indian joint-stock banks seem to be too small for the work they have to do. "Growing up in smooth times, they have thought more of attracting deposits than of retaining cash reserves. . . . In the case of the smaller banks, dealing as they are with clients to whom banking is a new thing, and in a country where hoarding is still dominant, the cash balances seem, from the available indications, to be hopelessly inadequate" (page 225). The question of a central bank is then discussed. We believe that an Imperial Bank of India, similar in many respects to that of Germany, but modified to suit Indian conditions, will ultimately under stress of circumstances be created. Among the advantages—and to anyone who has toured in the various provinces of India these are very great—a Central Bank would be a strong support not only to Government but to trade. Part of the funds kept in treasuries would be placed at the disposal of trade, reducing discount rates and benefiting commerce and industry. The management of all financial operations, whether internal or external, would be undertaken by the bank in addition to the management of the Paper Currency Reserve. We congratulate the author of *Indian Currency and Finance*. His is a book that is worth buying, reading, and keeping. G.F.S.

5.—*Die Finanz- und Zollpolitik des Deutschen Reiches*. Von Dr. Wilhelm Gerloff. xvi + 553 pp., Svo. Jena: Gustav Fischer, 1913. Price 14 marks.

The full title of this work indicates that the purpose of the author has been to furnish a critical survey of the financial and commercial policy of the North German Confederation and the German Empire, with special regard to the effect of that policy upon the finances of the individual states and of the local authorities. In his preface Dr. Gerloff explains that he had intended to complete his work with a second volume containing a detailed account of the development of imperial revenue and expenditure, and of the forms of financial administration and control, but his recent professorial appointment to an Austrian university has caused that part of his undertaking to be postponed indefinitely; the footnote on p. 53 is, therefore, a little misleading. But even in its restricted scope, Dr. Gerloff's book is of great interest and utility in three important respects: it shows how a commercial policy, originally adopted largely for politico-financial reasons, has been diverted to other purposes, with results altogether unsatisfactory from the financial standpoint; it sets out clearly the financial problems inherent in any federal system; and it examines carefully the relations between the finances of the Empire and those of the states and communes—a matter which has been touched on only lightly, if at all, in most of the literature called into being by the discussions as to financial reform which have been proceeding in Germany since 1908.

As regards commercial policy, Dr. Gerloff's views are perfectly clear; he is opposed to the system which is represented by the

German tariff of 1906. Like other German critics, he considers the commercial treaties based on that tariff to be disappointing—in his view inevitably so; and he holds the tariff responsible for a substantial proportion of the increased cost of living, and consequently for the rise in public expenditure owing to the advance in salaries, &c., avowedly necessitated by the upward movement of prices. He emphasises (p. 423) the fact that whilst the proportion of customs revenue to total imperial revenue fell from 47·8 per cent. on the average for 1898-1900 to 40·8 per cent. on the average for 1908-10, the proportion of the yield of the grain duties to the total customs yield rose from 27·3 per cent. in the first period to 34·4 per cent. in the second period. Dr. Gerloff has a great admiration for the policy and achievements of Count Caprivi; to him the essential thing now is for Germany to find a statesman who shall have the courage to emulate Caprivi in a new "act of rescue."

For the financial administrators of the Empire Dr. Gerloff has no higher regard than for the authors of German fiscal policy. He remarks (p. 74) that Germany has always lacked great statesmen-financiers—a lack which was most conspicuous in the years immediately following the establishment of the Empire; the reform schemes formulated by von Sydow and his associates in 1908, but wrecked in the Reichstag, have, however, his strong approval. Much of Dr. Gerloff's narrative, and many of the conclusions which emerge, will be familiar to English students of the subject:—the demoralising effect of the French war indemnity, which initiated a lavish expenditure (p. 101); the confusion caused by the matricular contributions, especially after the adoption of the "Franckenstein clause," when what had been intended as a reserve source became an ordinary source of revenue (p. 419); the manner in which, year after year, attempts at reform failed before the resistance of sectional interests and the legislative weakness of a Government distrusted by the representative body to which it is not responsible; and the financial maladministration of which the history of the "Reichsinvalidenfonds" (pp. 340—344) furnishes the most conspicuous example. More novel are the accounts of the financial situation and changes made from time to time in the various states, and the way in which these were affected by the imperial finances ("it is difficult to decide which of the two, imperial or state finance, was the more adversely affected by their interdependence"); and the severe criticism of the manner in which imperial financial legislation has recently interfered with and restricted the taxing powers of the communes, as, for example, by the abolition of octroi duties on certain articles of general consumption (without the provision of any substitute) and the provisions of the Imperial Increment Duty Law. Unfortunately his narrative does not cover the latest and, in some ways, most interesting of German experiments.

It has been possible in this place to indicate only in outline the nature and scope of Dr. Gerloff's valuable work, which is full of detailed information derived from a careful study of government publications, parliamentary debates and much unpublished

departmental material. There is a useful statistical appendix, which would have been of greater service if it had included tables relating to Bavaria (it is not clear why the reader is simply referred, in the case of that state, to a series of not very accessible official publications), and to some of the smaller states besides Mecklenburg-Schwerin. The book may be cordially recommended to all students of finance and politics.

P.A.

6.—*The Spirit of Association: being some account of the guilds, friendly societies, co-operative movement, and trade unions of Great Britain.* By M. Fothergill Robinson, author of *The Poor Law Enigma*. xii + 403 pp., sm. 8vo. London: Murray, 1913. Price 6s. net.

Mr. Robinson's previous book was noted in the *Journal* for April, 1912, as containing sound views, and we are justified in making the same observation on the present volume. He states that the circumstances in which it has been prepared have made it impossible for him to undertake any original research or any examination of ancient records, and adds the just remark that much that is germane to the subject of British associative effort yet remains imperfectly explored. Indeed, he has not exhausted the sources of knowledge that are accessible in printed works, *e.g.*, the publications of the London and Middlesex Archaeological Society. He would there have found much additional information regarding the ancient knighten gild of London, dissolved in 1125, also regarding the practice of depositing the rules of secular guilds in the court of the Bishop's commissary in the fourteenth and fifteenth centuries so as to allow of proceedings for the enforcement of those rules to be taken in the ecclesiastical courts, and generally relating to the history of the several London guilds. His book is nevertheless useful and timely. "We stand," he says, "at the parting of the ways. The purely voluntary character of associative effort in Great Britain for mutual assurance is now a thing of the past. The State has stepped in." A work in which the results that have been obtained under the inspiration of the principle of association from the earliest times to the present day are clearly and succinctly stated in an interesting manner cannot fail to convince the reader of the great benefits that principle has conferred upon the community. It is a fact well worthy of being recorded and impressed upon the public mind that all our important institutions owe their origin to the action of the people in voluntarily associating themselves together for a purpose of common advantage. It is thus, as Mr. Robinson points out, that gild methods were in ancient times adopted by municipal authorities, and in their turn accepted as the basis of general legislation affecting the whole community.

We pass over the author's discussion of the origin of English guilds, their classification as religious and social guilds, trade guilds, and craft guilds, and the industrial revolution which has transmuted them, on the one hand, into friendly societies, on the other, into trade unions, with the observation that he has given an excellent summary of the literature extant on all those matters; and we proceed to consider his account of the Friendly Society movement.

The obscurity which surrounds its origin and early days is not surprising. The idea of a permanent Friendly Society, accumulating funds to meet future risks, was not familiar to the people who associated themselves together in small local clubs, which in general lasted only for a single generation or so, and kept no records. The affiliated orders themselves were merely groups of such small bodies, as may appear from the fact that even now branches of some of the minor orders do not graduate their contributions. The inherent unsoundness of this method was frequently disguised by the spirit of self-esteem and of consideration for their poorer brethren which led members to abstain from making claims upon the funds if not under necessity to do so. This element, which gives the societies their distinctive name as "friendly societies," still exists, but to a smaller extent, and this may perhaps account for the circumstance that successive observations of the statistics of claims for sick-pay have shown a gradual increase. One consequence has been that the progress of societies towards complete financial soundness has been slow. Another consequence has been that the legislature, in attempting to promote that progress, has had alternate hot and cold fits, at one time seeking to make the societies sound by Act of Parliament, at another more wisely leaving them to the voluntary action which in general produces the best results. The Act of 1875, which is still in effect the statute governing them, embodies the mature wisdom of the legislature in this respect. Its lines were laid down by the late Mr. J. M. Ludlow, whose great public services deserved a higher acknowledgment than they ever received. The ideas embodied in it are those of providing the members of every society with exact knowledge of its position, giving them access to official help for the remedy of wrongs and the protection of minorities, and maintaining unimpaired the voluntary principle.

Mr. Robinson devotes four chapters to the co-operative movement and five to trade unions. Space will not allow of our commenting upon these. His conclusions are in favour of voluntary association as against legislative action. When the legislature adopts the position of pioneers, unsupported by the real desire of the nation as a propelling force, the task it attempts proves too often to be beyond its powers. When the State enters into competition with voluntary association, or seeks to shoulder its burdens, the voluntary association necessarily undergoes fundamental change, and will probably die out. Voluntary effort is more elastic than statutory regulation can be, and moulds itself from time to time to meet new requirements. Legislation lags behind, while voluntary association leads the van. Progress can only be surely attained by the building up of individual character. With all these views we agree.

The author has taken a hint we gave on the previous occasion, and has provided this book with an index. E.B.

7.—*Le Syndicalisme et la Prochaine Révolution*. Par M. Dufour, Ex-Professeur d'Economie Politique. 436 pp., Svo. Paris: Marcel Rivière et Cie, 1913. Price 6 francs.

The author has retained at least one not uncommon attribute of the professorial chair: he is a good hater, and his language is not

only authoritative but vigorous. Indeed, it is curious to reflect how the more a man is opposed to "authority," the more uncompromisingly does he demand unquestioning belief in his own views—and this is particularly true of our author. The book is not negligible, far from it; one might guess that it is only the price of six francs which may secure the author against prosecution. It is an interesting and in some ways a fascinating book. Everything seems so axiomatic when couched in the clear, crisp French style, till after reading some chapters one feels in a nightmare in which any postulate may come true.

In the first part of the book we are on familiar ground, "Property is theft." The public has already paid back to the capitalist in the surplus of selling-price over cost many times the capital advanced. The factory system is falling to pieces under the strain of its own development. The only novelty is that the demonstration is backed up by some very general figures, which do not look as if many of them would bear analysis. The conclusion is that it is the duty of everyone to help forward the revolution by direct action and propaganda. Sabotage is not only permissible but laudable, for the workers are only destroying their own property. The "State" is both thief and assassin, and, therefore, the State and patriotism and militarism must be fought by all means—"on occasion by firing on employers and officers." Legality is in complete opposition to the interests of the community, and consequently, says M. Dufour, in words which have a very familiar ring about them, "it is the duty of the proletariat to transgress it on every possible opportunity." The Socialist party are entirely in the wrong path and their doctrines are false and impossible. It is with some relief that we read that "the immense majority of the public is quite incapable of understanding" the reasons which make syndical rule both imperative and possible, but in the next paragraph our relief is dashed by the conclusion that "in these circumstances an intelligent minority will begin the revolution by force."

In the organisation of the future every industry is to be directed by a federal assembly which will decide all economic questions, the duration of work, amount of payment, &c., and by a federal committee charged with the administrative and technical work. These federal assemblies will be formed of delegates from all the local trade unions and will sit in one of the chief industrial centres. In the towns each industry will be directed by its syndical assembly and its syndical committee, both constituted either by the members working in a trade or by their delegates. The assemblies will be "entirely analogous" to the present trade union organisations which conduct strikes and discuss labour questions; they will appoint the administration committees of technical experts. The committees will choose the management staff and will take "all the necessary steps to ensure work immediately to every person asking for it"; they will also reserve occupations for women, and decide as to the use of machinery. The committee of each industry will negotiate with the committees of other industries as to the conditions on which it will obtain its supplies of materials, tools, &c. Prices

will be fixed by the technical staff after approval by the committee. "The administrative committee as well as the managers of the different departments should possess the disciplinary powers, such as fines, &c., necessary to ensure obedience." Fines, it may be noted, are one of the most keenly-felt grievances of the present system, but in Utopia there will be no injustice.

We will thus have federal assemblies for mines, textiles, railways, sea-transport, &c., and in agriculture there will be 3,000 local syndicates, grouped into regional federations, and centralised into a national federation. This New Jerusalem will be ushered in by a general strike, accompanied by a "serious sabotage," a simultaneous insurrection breaking out in all industrial centres, and wholesale desertions from the army. And yet most persons, including "exp-professors of political economy," insist upon some relation between "end" and "means."

H.W.M.

8.—*La Réglementation du Travail réalisée ou projetée : Ses illusions et ses dangers.* Par Edouard Payen. iv + 258 pp., crown 8vo. Paris : Félix Alcan, 1913. Price 3 fr. 50 c.

Readers of Herbert Spencer's well-known essay on "Man *versus* the State" will perhaps remember that in that vigorous plea for individual liberty it was forcibly contended that one "interference" of the State led inevitably to others in the vain attempt to undo or correct the mischief caused by the initial departure from the strait path of right policy. The brochure now before us might aptly be described as a rousing discourse upon this text. In clear and forcible language the author illustrates the failings of French legislation which has tried, by means of official inspection and control, increasing in rigour and extending in range, to regulate the hours and the other conditions of work in his country. He maintains, for instance, that in such a case as the recent prescription of a weekly day of rest, the law has been confronted by difficulties which were not perhaps contemplated, or at least were not fully understood, by the authors, or supporters, of the enactment, that its enforcement has necessarily been accompanied by express exceptions, or by tacit evasions, which in effect have made it more inoperative, where it was not originally otiose, than impetuous unthinking legislators had conceived, that it has already produced some unwelcome consequences, and caused some difficult situations which might have been avoided, and that on the whole it may be doubted whether it has advanced or retarded a voluntary movement in a wished and desirable direction, which was making favourable progress before the law appeared upon the scene.

That M. Payen is free from *parti pris* will scarcely be affirmed any more certainly than such an assertion could have been put forward about Herbert Spencer, and, like that distinguished philosopher, he may fairly be said to state with emphatic confidence one side of the case alone. Nor indeed is he himself unconscious that he can be held to play the role of an "advocatus diaboli," for the second portion of his essay, where he examines the fresh schemes which are being projected in addition to, or extension of, those

enacted measures to which he has turned his critical attention in the earlier section of his book, shows demonstrably that it is a popular, if it is not an irresistible, trend of public action to which he offers his strenuous and skilful, if not wholly opportune and successful, opposition. The proposals for the increasing "interference" of Governments with the "liberty" of individuals, whether they be employers or wage-earners, or whether they be vendors or purchasers of goods and services alike, will not, it is evident, grow less in number, or contract their scope, in the immediate future, whatever M. Payen and his sympathisers may allege or prove. In that sense he and those who share his views are "voices crying in the wilderness."

But it is none the less wholesome that such stout protests should be made, and the impartial bystander, if such there be, will not do amiss to pay attentive heed to argument, which is not at present in great favour, when it is, as here, supported by the plain testimony of official documents. The unvarnished incontestable facts, to which our author continuously refers, may indeed be treated in some instances as the damning evidence which unwilling but honest witnesses feel bound to give; and they suffice to show that all this legislation has its own characteristic "illusions" and is by no means immune from many serious "dangers." It is obviously prone to overreach itself by becoming too ambitious. It provokes into ominous activity some evils which so long as they were latent were innocuous; and it gratuitously, if unintentionally, gives rise to others; while it imperils the continued influence of the very admirable qualities which attach to individual self-help and to independent voluntary initiative. In this controversial pamphlet a persuasive advocate quotes actual chapter and verse for the details of the thesis he propounds.

L.L.P.

9.—*Progress and uniformity in child-labour legislation.* By William F. Ogburn, Ph.D. (Studies in History, Economic and Public Law. Edited by the Faculty of Political Science of Columbia University. Vol. xlviii.) 219 pp., 8vo. New York: Columbia University, 1912. Price 7s.

Dr. Ogburn has collated those laws enacted by the various state legislatures of America during the last third of a century which directly or indirectly regulate the industrial employment of children. Each such law has been carefully analysed and the results grouped. In the first two chapters the occupation groups are defined and the extent and nature of exemptions authorised by the laws discussed. In the following chapters, age limits, hours of labour, educational requirements, working papers, penalties and inspection are successively examined with the help of many analytical tables and in the last chapter the various enactments are considered more generally. A principal object kept in view by the author was to ascertain whether the general trend of legislature was towards a greater or less degree of uniformity throughout the States. He has adopted two statistical methods of studying this problem. Thus he has determined, *e.g.*, the average age limit prescribed by the various

laws in operation during each quinquennial period and the standard deviations; a diminution in the latter, assuming the mean to be unaltered, indicates a greater degree of uniformity. Where the means differ the coefficient of variation has in some cases been used.

In cases which do not admit of the calculation of ordinary arithmetical means and standard deviations, the author employs the following process: he ascertains what form of enactment most commonly occurs in each period and determines for each quinquennium what proportion of all the provisions in force conform to this type; the greater the proportion, the greater the uniformity.

Dr. Ogburn seems fully alive to the fact that both these methods need to be used with caution and we do not think his employment of them is open to serious objection. As he points out, a good deal depends upon the strictness with which the laws are enforced; thus he remarks that there has been considerable progress in the number of states that provide for inspection; in 1879 only 12 made any kind of provision while in 1909 the number was 46. But, "it should be remembered that in many of these states the inspection is very lax, and that many inspection provisions apply only to mining."

The tables set forth a gratifying improvement in the general conditions, but how far the appearance corresponds to the reality is a question which can only be answered by those possessing considerable local knowledge.

Dr. Ogburn's work may be recommended to all students of the subject discussed, and he should be congratulated on the completion of a very laborious task.

M.G.

10.—Other New Publications.*

Del Vecchio (Gustavo). Relazioni fra entrata e consumo. 114 pp., 8vo. Roma: Giornale degli Economisti, 1912.

[Family budgets in different countries, and their degrees of accuracy as measuring the social and economic conditions of the people.]

——— *Le variazioni periodiche dello sconto.* 68 pp., 8vo. Roma: Giornale degli Economisti, 1913.

[A statistical study of the periodicity in the variations in the rates of discount on the principal money markets of Europe and America, and of the causes thereof.]

Devaerlin (Maurice) and Lecarpentier (Georges). La protection légale des travailleurs aux États-unis, avec exposé comparatif de la législation française. 348 pp., 8vo. Paris: Marcel Rivière and Co., 1913. Price 8 francs.

[Describes legislation passed by the Federal and different State governments of the United States for the protection of workmen and others engaged in industrial occupations, and compares it with the laws bearing on this subject in force in France. The subject is of increasing importance, and the United States offers a special interest to students, owing to its great industrial activities, and to the diversity of the laws in force in the different States. The book is divided into nineteen chapters dealing with different phases of the subject, and in a concluding chapter the authors sum up the leading differences between the industrial legislation of the two countries and their deficiencies.]

* See also "Additions to the Library," page 843 *sqq.*

Finizio (Prof. G.). Mortalita Infantile in rapporto alle condizioni dei genitori. 22 pp., 8vo. Rome: Tipografia Editrice Nazionale, 1913.

[A short study of the influence of the employment of women and of their social and economic condition generally on the mortality of infants in Italy and other countries.]

Guyot (Yves). L'A B C du Libre-Échange. vii + 209 pp., sm. 8vo. Paris: F. Alcan, 1913. Price 2 francs.

[This book forms the second volume of the series issued by the French Free Trade League and is of a more general nature than the first volume by M. Schelle. The case for free trade is given with the author's usual ability, and his study of the subject under all its aspects should be read by those interested in the question of fiscal reform.]

Hinckes (Ralph T.). The Farmers' Outlook. A review of home and overseas agriculture, 1880-1913. 140 pp., 8vo. London: Jarrold and Sons, 1913. Price 1s. 6d. net.

[A short review of the agricultural, live-stock, and dairying industries of the principal producing countries, and of their influence on British agriculture and the question of food supply. The book contains chapters on the rise in food prices, the world's wheat and meat trades and British agriculture. The author is of opinion that the outlook for British farming is more promising than for many years past owing to the demand for home-grown foodstuffs and that the development of British agriculture would be to the interest of all classes in this country.]

Indian Currency and Finance. 241 pp., 8vo. Bombay: Bennett, Coleman and Co., 1913.

[At the request of many people interested in Indian currency and finance, the articles on these questions which appeared in the *Times of India* from March, 1910, to April, 1913, have been reprinted. As these articles dealt with the particular phases of the question illustrated by the news of the day, it was impracticable to group them under heads. They have, therefore, been arranged in chronological order.]

Levy (Hermann). Economic Liberalism. ix + 124 pp., 8vo. London: Macmillan and Co., Ltd., 1913. Price 4s. 6d. net.

[The author traces the foundation of England's modern industrial state to the seventeenth century. His study is an attempt to show the relation of early theories of industrial freedom to contemporary economic development, and to trace the reaction of these theories on the economic and social legislation of the seventeenth century.]

Parkinson (Rt. Rev. Monsignor Henry), D.D. Primer of Social Science. xii + 276 pp., 8vo. London: P. S. King and Son, 1913. Price 2s. net.

[This book is an attempt to meet the requirements of a simple and yet comprehensive manual of Social Science for the use of Catholics interested in social questions. It is intended for beginners, and aims at presenting social science with some completeness of outline and under the light of Catholic principles.]

Zahnbrecher (Dr. Franz Xaver). Lohnstatistik. 72 pp., 8vo. Nürnberg: T. L. Schrag, 1913. Price 2 marks 50 pf.

Catholic Studies in Social Reform. II. Sweated Labour and the Trade Boards Act. Edited by the Rev. Thomas Wright. 2nd edition. 78 pp., 8vo. London: P. S. King and Son, 1913. Price 6d. net.

——— V. First notions on social service. Edited by Mrs. Philip Gibbs. 80 pp., 8vo. London: P. S. King and Son, 1913. Price 6d. net.

Spain. Sociedad Anónima Arnús-Gari, Barcelona. La Richesse de l'Espagne pendant la décade 1903-12. 40 pp., 8vo. Barcelona, 1913.

[A short review of the modern development of Spain, considered under the heads of agriculture, mines, manufacturing industries, railways, shipping, trade, the national finances, banking and thrift. As an appendix is also given a list of the principal securities quoted on the Barcelona Stock Exchange.]

CURRENT NOTES.

The trade returns show considerably increased values in imports, exports, and re-exports. It should be noted, however, that in June, 1912, the returns were much affected by the London transport strike. The subjoined tables compare the returns of the twelve months ending June, 1913, with the twelve months ending June, 1912 :—

[000's omitted.]

Imports.	Twelve months ending June, 1913.	Twelve months ending June, 1912.	Increase (+).
Imports, value c.i.f.—	£	£	£
I. Food, drink and tobacco	283,895,	263,990,	+ 19,905,
II. Raw materials and articles mainly unmanufactured	278,743,	247,180,	+ 31,563,
III. Articles wholly or mainly manufactured	186,930,	166,098,	+ 20,832,
IV. Miscellaneous and unclassi- fied (including parcel post)	2,983,	2,454,	+ 529,
Total merchandise.....	752,551,	679,722,	+ 72,829,
Imports of bullion and specie	69,668,	62,692,	+ 6,976,

[000's omitted.]

Exports.	Twelve months ending June, 1913.	Twelve months ending June, 1912.	Increase (+).
Exports of produce and manu- factures of the United Kingdom, value f.o.b.—	£	£	£
I. Food, drink and tobacco	32,825,	29,209,	+ 3,616,
II. Raw materials and articles mainly unmanufactured	60,481,	54,227,	+ 6,254,
III. Articles wholly or mainly manufactured	391,750,	360,411,	+ 31,339,
IV. Miscellaneous and unclassi- fied (including parcel post)	10,242,	9,131,	+ 1,111,
Exports of foreign and colonial merchandise, value f.o.b.—			
I. Food, drink and tobacco	15,629,	13,923,	+ 1,706,
II. Raw materials and articles mainly unmanufactured	68,698,	57,827,	+ 10,871,
III. Articles wholly or mainly manufactured	30,139,	27,857,	+ 2,282,
IV. Miscellaneous and unclassi- fied (including parcel post)	174,	137,	+ 37,
Total, British, foreign and colonial	609,938,	552,722,	+ 57,216,
Exports of bullion and specie	65,740,	58,157,	+ 7,583,

[000's omitted.]

Shipping.	Twelve months ending June, 1913.	Twelve months ending June, 1912.	Increase (+).
	Tons.	Tons.	Tons.
Total, British and foreign, <i>entered</i> } with cargoes	46,817,	42,141,	+ 4,676,
Total, British and foreign, <i>cleared</i> } with cargoes	62,339,	59,769,	+ 2,570,

Mr. Sauerbeck's index-number for June, as given in the *Statist*, is 84.1, as against 85.7 in May, the average of the eleven years 1867-77 being taken as 100. The fall in the index-numbers made further progress in June, and one must go back to February, 1912, for a lower index to figure. The fall extended to every group, with the exception of animal food, which rose. The greatest decline occurred in minerals, the prices of iron and tin having fallen heavily, while copper, lead and coal were somewhat lower. Barley, oats, and maize, coffee and sugar were all down. Among textiles flax, hemp, jute and Colonial wool fell, while English wool and American cotton were slightly higher. Articles of food were 77.3, as against 77.2 in May, and materials were 89.0, as against 91.9. The *Economist* index-number was 2,669, as compared with 2,694 in May.

According to the Board of Trade *Labour Gazette* the state of the labour market in May was as follows:—

	Trade Unions making returns. Net membership.	Reported as unemployed.	
		Number.	Percentage.
May, 1913	910,692	17,138	1.9
April, 1913	912,046	15,719	1.7
May, 1912	836,949	22,307	2.7

Employment in May continued, on the whole, very good. There was a considerable improvement in the tinplate and brickmaking industries, and a further advance in the building trades. On the other hand, there was some falling-off in the textile, boot and shoe, and glass trades; and employment at iron and steel works, though still good, showed a further decline. Employment in coal mining, engineering and shipbuilding remained at about the same high level as in April. It is reported by the Labour Exchanges that there was a continuance of the demand for workmen of all classes in the shipbuilding and engineering trades. In the case of women, the demand exceeded the supply in the cotton, woollen and worsted,

linen, and clothing trades, and in laundry work. There was also a demand for women in the Birmingham plate and jewellery trade. The upward movement in wages continued. Compared with a year ago most of the principal industries showed an improvement, which was most marked in the coal mining, engineering, shipbuilding, and printing trades. There was, however, some decline in the tinplate, textile, glass, and boot and shoe trades.

A return has been issued by the Local Government Board in pursuance of an order of the House of Commons (No. 119. Price 3*d.*) showing, for the year 1911-12, with respect to each municipal borough or other urban district in England and Wales, the area, in acres, of the borough or district and of the agricultural land as defined by the Agricultural Rates Act, 1896, the total amount of rates collected, and amount of rates collected in respect of agricultural land. The municipal boroughs and the urban districts in England and Wales number 1,136, and of these areas 325 are municipal boroughs, including 75 county boroughs. The return does not extend to London. At the date of the Census of 1911 there were three urban districts with a population exceeding 500,000 and 40 others with a population exceeding 100,000. On the other hand, 24 had a population of less than 1,000 and 382 others a population of less than 5,000. Some of the least populous urban districts are much greater in area than the very populous districts; thus the borough of Welshpool, with a population of 5,917, has an area exceeding 20,000 acres, while the borough of Liverpool, with a population of 746,421, has an area under 17,000 acres; the urban district of Mallwyd, with a population of 757, has an area of 14,000 acres, while the urban district of Willesden, with a population of 154,214, has an area of less than 4,500 acres. One urban district (Birmingham) has an area of 68 square miles. Many urban districts comprise large areas of agricultural land. The general result of the return is to confirm the information obtainable from the Annual Local Taxation Returns as to the comparatively small amount of rates paid in respect of agricultural land in urban areas. An estimate based on the rateable value of agricultural land and the average rates in the pound in these areas in the year 1910-11 gives 410,000*l.* as the amount paid, excluding land drainage rates, and the corresponding figure in the return is 413,000*l.* As the urban districts vary greatly in character, there are naturally some differences in the proportion of the rates borne by agricultural land in particular cases, and there are a few cases in which the proportion is very much above the average, owing to the large extent of agricultural land and its valuable nature. Leaving out of account

Items.	Area in acres.		Total amount of public rates collected in respect of		Total number of assessments.		Population (Census, 1911).
	Total area (including agricultural land). 2	Area of agricultural land. 3	All hereditaments (including agricultural land). 4	Agricultural land. 5	All hereditaments (including agricultural land). 6	Agricultural land. 7	
I							
I—Urban districts for which an estimate of the extent of agricultural land has been furnished—							
(i) 11 "self-contained" boroughs	92,771	38,322	2,592,488	£ 11,219	325,699	3,614	1,487,135
(ii) 1,065 other urban districts	3,701,368	2,494,713	32,836,813	389,470	4,844,010	149,808	19,719,315
(iii) Totals of items I (i) and I (ii)	3,884,139	2,533,035	35,429,301	400,689	5,169,709	153,422	21,206,450
II—Urban districts for which an estimate of the extent of agricultural land has not been furnished—							
(i) 1 "self-contained" county borough	10,935	Not ascertained	455,766	1,438	71,231	392	259,904
(ii) 59 other urban districts	202,304		3,900,779	23,152	532,969	8,811	2,193,455
(iii) Totals of II (i) and II (ii)	213,139		4,356,545	24,590	604,200	9,203	2,453,359
III—Totals for all urban districts except the 12 "self-contained" county boroughs—	3,993,572	Not ascertained	36,737,592	412,622	5,376,979	158,619	21,912,770
[Items I (ii) and II (ii)]							
IV—Totals for all urban districts [Items I (iii) and II (iii)]	4,097,278	Not ascertained	39,785,846	425,279	5,773,909	162,655	23,659,809

two or three very exceptional cases where the extent of agricultural land in the district is small and the valuation is very high, the average rateable value per acre in the several urban districts varies from 4*l.* or more to less than 1*s.* The acreage of agricultural land in the urban districts range from as much as 22,000 acres (Holbeach) to 10 acres. At Holbeach the average rateable value of the agricultural land is 2*s.* 3*d.* per acre, and the proportion of rates borne by such land is more than half. In the case of Ramsey (16,000 acres of agricultural land) the proportion is even higher. The average value of the agricultural land in this case is 30*s.* 3*d.* per acre. At Mallwyd, in Wales, where the agricultural land is nearly 14,000 acres in extent, with an average rateable value of 2*s.* 10*d.* per acre, most of it being mountain land, the rateable value of the other property is comparatively small, and the amount of rates paid in respect of agricultural land is about one-third of the whole amount collected. On the other hand, in the districts of Glynceorwg and Rhondda, in Wales, containing agricultural land to the extent of about 13,000 and 20,000 acres respectively, the average rateable value is 10*d.* per acre in the one case, and 2*s.* 2*d.* per acre in the other, and the rates paid in respect of it were in the first case little more than a one hundred and seventieth part of the whole amount collected in the urban district, and in the other case about a seven hundred and fiftieth part. The figures in the return are summarised in the table on the preceding page.

Another recent return of the Local Government Board [No. 307, Price, 2½*d.*] shows "the number and classification of mentally defective persons (other than persons certified as insane) in receipt of institutional relief or otherwise chargeable to a union or parish in England and Wales on a given day, grouped according to sex and, in the case of women, condition as to marriage, and distinguishing persons over 60 and under 16 years of age." It should be noted that the particulars furnished in the returns depend mainly upon the opinions formed by the various poor law medical officers respecting the cases under their care. The following statement shows the total number of mentally defective paupers in England and Wales on the date to which the returns relate:—

	London.	Wales (with Monmouth).	England and Wales.
Men.....	1,468	721	12,389
Women ...	2,402	1,065	17,095
Boys	263	69	1,250
Girls ...	190	53	1,090
Total.....	4,323	1,908	31,824

Of the total of 29,484 adults, 10,051, or more than one-third, were persons of 60 years of age or upwards. Of the 17,095 women, 10,215, or 59·8 per cent., were single women without children, and 1,291, or 7·5 per cent., were single women with children, the 5,589 married women being almost equally divided between those with children (2,843, or 16·6 per cent.) and those without (2,746, or 16·1 per cent.). The 31,824 persons were further classified in the returns according to a revised classification adopted in the Mental Deficiency Bill, 1912, as introduced in the Commons, as follows:—

Idiots	1,766, or 5·5 per cent.
Imbeciles	4,887, „ 15·4 „
Feeble-minded	14,172, „ 44·5 „
Moral imbeciles	727, „ 2·3 „
Mentally infirm	10,272, „ 32·3 „

It will be seen that the great majority are classed as “feeble-minded” or “mentally infirm.” The definitions in the case of these two headings are particularly comprehensive; and so far as the heading “mentally infirm” is concerned, it is to be borne in mind that more than one-third of the adults were persons over 60 years of age.

Comparison with previous items is misleading. In 1905 a return was obtained by the Local Government Board showing the number of feeble-minded persons under 60 years of age not classed as insane, who were in receipt of relief from Boards of Guardians in England and Wales on January 1 of that year, and a similar return for January 1, 1906, was obtained by the Royal Commission on the Care and Control of the Feeble-Minded, the results of both returns being published as an appendix¹ to the final report of the Commission in 1908.² In both cases instructions were given that the persons to be returned as “feeble-minded” should be those who, in the opinion of the poor law medical officer, were mentally defective, but could not be classed as insane. The following statement gives the total figures obtained in 1905, and those in the present return, so far as relates to persons under 60 years of age:—

	1905.	1912.
Adults.....	9,370	19,433
Children under 16—		
Boys	788	1,250
Girls		1,090
Total.....	10,158	21,773

¹ Cd. 4219.² Cd. 4202.

In view of the large apparent increase in the numbers between 1905 and 1912, some inquiries have been made in the cases of a few unions which showed exceptionally large increases, with the object of getting explanations which would throw light on these differences. So far as the results of these inquiries go, they seem to show that no real increase has taken place on such a scale as the above figures would suggest. Whatever increase may have actually occurred, the main explanation of the large difference between the figures seems to turn on classification. Most probably a large part of the apparent increase is due solely to the wide scope of the definitions of the five subheads into which the term "mentally-defective" is divided in the present return (and more especially of those referring to "feeble-minded persons" and "mentally infirm persons"), as compared with the single direction given in connection with the Return of 1905 that those persons were to be included who were "mentally defective, but could not be classed as insane." Some of the officers consulted have had no doubt that certain cases were included in the present return which had been omitted in 1905, and particular instances of the kind have been quoted.

The first number has been issued of the *Labour Bulletin*, a quarterly publication of the Labour and Industrial Branch of the Australian Commonwealth Bureau of Census and Statistics, to the establishment of which reference was made in the JOURNAL (vol. lxxvi, p. 342, 1913). In this Bulletin, the first of a quarterly series, the Branch is enabled to present statistics for the first quarter of the year 1913, together with summarised results for previous years in regard to several of the more important subject of inquiry. The method of presentation and arrangement of sections adopted in the Bulletin will be substantially preserved in future issues, and it is proposed to bring together each year the figures for the individual quarters, and to embody the results in an Annual Report. The results are given, as far as possible, on a fully comparable basis for each State. The Bulletin comprises, besides a general survey of industrial conditions, reports from industrial centres, particulars of unemployment, a section on retail prices, house-rents and cost of living, as well as sections on wholesale prices, industrial disputes, changes in rates of wages, assisted immigrants, State Free Unemployment Bureaux, industrial accidents, recent legislation in Australia especially affecting labour, international labour statistics and the need for their co-ordination, reports of Departments and Bureaux in Australia, and, finally, Labour matters abroad and Imperial and foreign publications received. The Bulletin also contains a graph showing cost of living, wholesale prices and nominal and effective wage index-numbers and unemployment.

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

Accountants' Magazine. July, 1913—Social unrest: *Jones (J. H.)*, M.A.

Bankers' Magazine. July, 1913—The autumnal drain of specie. The revised Canadian Bank Act: *Eckardt (H. M. P.)*. Growth of leading savings banks: *Gibson (A. H.)*.

Financial Review of Reviews—

June, 1913—The progress of profit-sharing and co-partnership. With preface by the Right Hon. the Viscount Hill, L.C.C. The British steel trade and the need of organisation: *Good (T.)*. Geographical distribution of capital and the interdependence of nations: a criticism and a rejoinder by Norman Angell. The citizen's burden: how it grows and where its weight falls.

July, 1913—The finance of Scottish Home Rule: *Watt (Henry A.)*, M.A., M.P., and *Hynes (T.)*, LL.B. The cost of education: does the nation get value for the outlay?

Journal of the Board of Agriculture. June, 1913—Experiments in agricultural co-partnership.

Surveyors' Institution. Professional Notes. Vol. 19. Part 2. 1913—Land taxation in the Australian Commonwealth and the New Zealand Dominion: *Tomlin (F. F.)*.

United Empire. (*Royal Colonial Institute Journal.*) June, 1913—Agriculture and land settlement in South Africa: *Macdonald (Dr. Wm.)*. Australian prices and cost of living: *Grice (J. Watson)*, D.Sc..

UNITED STATES—

American Economic Review. June, 1913—Judicial interpretation of the minimum wage in Australia: *Hammond (M. B.)*. Pensions as wages: *De Roode (Albert)*. The rise of the Iron Molders' International Union: *Hoagland (H. E.)*. The rates and practices of express companies: *Field (Arthur S.)*. "The equation of exchange" for 1912, and forecast: *Fisher (Irving)*.

Journal of Political Economy. June, 1913—The spirit and social significance of scientific management: *Cooke (Morris L.)*. Security prices and interest rates in 1910-12: *Mitchell (Wesley C.)*. Certain changes in New York's position as a financial center: *Patterson (E. M.)*. Beet sugar and the tariff: *Blakey (Roy G.)*.

Yale Review. July, 1913—The crux of the currency question: *Andrew (A. Piatt)*. The high cost of living: *Bishop (Arvid Longley)*.

AUSTRIA—

Statistische Monatschrift. April, 1913—Die Städte Österreichs nach der Volkszählung vom 31 Dezember 1910: *Hecke (Dr. Wilhelm)*. Die amtliche Statistik des galizischen Aussenhandels 1772 bis 1792: *Grossman (Dr. Henryk)*.

FRANCE—

Journal des Économistes. June, 1913.—Les diverses formes de la mutualité: *Guyot (Yves)*. La loi anglaise d'assurance sociale de 1911: *Bellom (Maurice)*. Mouvement agricole: *Molinari (Maurice de)*. La production et l'emploi de l'or: *G. (Y)*.

Journal de la Société de Statistique de Paris. June, 1913—Les statistiques concernant la femme dans les États de l'Union Nord-américaine: *Pissargersky (Lydie de)*. Considérations statistiques sur le taux de l'intérêt: *Borel (Emile)*. Chronique des questions ouvrières et des assurances sur la vie: *Bellom (Maurice)*.

La Réforme Sociale. June 16, 1913—Repopulation et colonisation: *Thiollaz (M. E. de)*. Où en est la question de l'apprentissage? *Hubert-Valleroux (M.)*. Le Mouvement économique et social.—Pays de langue anglaise: *Angot des Rotours (Baron)*.

Revue d'Economie Politique. May-June, 1913—La lutte pour la suprématie mondiale dans les temps modernes: *Schriedland (E.)*. Le droit dans l'économie sociale: *Villey (Edmond)*. Le bassin de Briey et la politique de ses entreprises sidérurgiques ou minières: *Vignes (Maurice)*. Chronique Coloniale: Les banques coloniales: *Raynaud (B.)*. Chronique coopérative: *Lavergne (Bernard)*.

Revue des Sciences Politiques. May-June, 1913—Les ports de Mannheim: *Egger (Emile)*. Un centre industriel en Pologne: Lodz: *Vinard (Henri)*. La Chambre des Comptes de Prusse et la Cour des Comptes de l'Empire allemand: *Marcé (Victor)*.

GERMANY—

Archiv für Sozialwissenschaft und Sozialpolitik. May, 1913—Lohnabzüge für Wohlfahrtseinrichtungen: *Lotmar (Professor Philipp)*. Der preussische Wohnungsgesetzentwurf: *Lindemann (Dr. Hugo)*. Der "Allgemeine Jüdische Arbeiterbund" zur Zeit der russischen Revolution (1904-07). Die Arbeiterversicherung in Russland: *Lifschitz (Dr. F.)*. Der Anteil der Frauen an der Fabrikarbeit in Japan: *Simon (Dr. Edmund)*. Berufswahl und Berufsschicksal des modernen Industriearbeiters: *Bernays (Dr. Marie)*. Die Unternehmerorganisationen (Deutschland).

Jahrbücher für Nationalökonomie und Statistik (Conrad's). June, 1913—Der Rückgang der Geburten als soziales Problem: *Farth (Henr.)*. Stand und Leistungen der französischen Städtestatistik: *Müller (Johannes)*. Aufgaben der handelsgeschichtlichen Forschung: *Bächtold (Hermann)*. Die Brotpreise in Berlin im Jahre 1912: *Guralze (Hans)*. Oesterreichs Bevölkerung im Jahre 1910: *Frba (Rudolf)*. Der neueste Stand der Entwicklung des Arbeitstarifvertrages im Deutschen Reich und in Oesterreich: *Köppe (H.)*.

GERMANY—*Contd.*

Zeitschrift für Sozialwissenschaft. Heft 6, 1913—Die Preiskurve und das Teuerungsproblem: *Glier (L.)*. Der Ertragsgedanke: *Oswalt (H.)*. Akkulturation unter den Magyaren in Amerika: *Von Hoffmann (G.)*. Das Gesetz des abnehmenden Ertrags in der Landwirtschaft und das des zunehmenden Ertrags im Gewerbe: *Mannstaedt (H.)*.

Zeitschrift für die gesamte Versicherungs-Wissenschaft. July, 1913—Die neuen Arbeiterversicherungsgesetze in Russland: *Alexandrow (Dr.)*.

ITALY—

Rivista Italiana di Sociologia. March—April, 1913—Il fattore confessionale nella scelta matrimoniale: *Suvorqnan (F.)*. La democrazia in Italia alla fine del 1700: *Caristia (C.)*. Indici di benessere nelle varie classi di lavoratori: *Boldrini (M.)*.

MONTHLY LIST OF ADDITIONS TO THE LIBRARY.

During the period that has elapsed since June 10, 1913, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

(a) Foreign Countries.

Austria—

Land. Kataster der Gewerbegeossenschaften und deren Verbände in Tirol und Vorarlberg. i. Abteilung. v. Band. Svo. 1913. (The Ministry of Commerce.)

Statistik der Ausverkäufe im Jahre 1911. 73 pp., fol. 1912. (*Id.*)

Colombia—

Censo General de la Republica de Colombia, 5 Marzo 1912. 336 pp., fol. 1912. (The Ministry of Foreign Affairs.)

Denmark—

Census. Population du Royaume de Danemark, le 1^{er} Février 1911. 1^{re} Partie. 4to. 1913. (The State Statistical Department.)

Germany—

Census. Berufs- und Betriebszählung, 1907. Berufsstatistik-Abteilung X. Die berufliche und soziale Gliederung des deutschen Volkes. 4to. 1913. (The Imperial Statistical Bureau.)

Elections. Die Reichstagswahlen von 1912. Heft 3. 4to. 1913. (*Id.*)

Mexico—

Division Territorial de los Estados Unidos Mexicanos. 2 vols., Svo. 1913. (The Director General of Statistics.)

Norway—

Census. Recensement du 1 Décembre 1910 : Maisons habitées et ménages. Svo. 1913. (The Central Statistical Bureau.)

Elections en 1912 pour le "Storting." Svo. 1913. (*Id.*)

United States—

Census Bureau. Bulletin 112. Mortality Statistics 1911 . . . 4to. 1913. (The Bureau.)

Labour. Care of Tuberculous Wage Earners in Germany (Bulletin of Bureau of Labour Whole Number 101). Svo. 1912. (Mr. F. L. Hoffman.)

— Report on condition of woman and child wage-earners in United States, in 19 volumes. Vol. xix. Labour laws and factory conditions. Svo. 1912. (The Department of Labour.)

Massachusetts. The Immigrant Population of Massachusetts, 1913. Svo. 1913. (The Bureau of Labour.)

New York (*City*). Municipal Reference Library. City of New York. [Speeches at its opening, March 31, 1913.] 35 pp., Svo. 1913. (The Librarian.)

International—

Proceedings of Fifth International Congress of Mathematicians (Cambridge, August 22-28, 1912). Vol. 1. Part 1. Report of the Congress, Part 2. Lectures, Communications (Section 1). Vol. 2. Communications to Sections 2-4. 2 vols., la. Svo. Cambridge, 1913. (Professor T. G. Bonney, F.R.S.)

(b) **India and Colonies.****India, British.**

Malaria. Proceedings of third meeting of General Malaria Committee held at Madras November 18-20, 1912. 289 pp., fol. Simla, 1913. (The Committee.)

Burma. Burma Gazetteer for different Districts, Vol. B, including Town and Village Census Tables, Nos. 1, 3, 7, 11-15, 17, 18, 25 and 28. 12 vols., Svo. Rangoon, 1912. (The India Office.)

Australia, Commonwealth of—

Labour Bulletin. (Published quarterly.) No. 1. January-March, 1913. Svo. 1913. (The Bureau of Census and Statistics.)

Canada—

Opportunities in Canada, 1913. Svo. 1913. (The Canadian Emigration Office.)

Jamaica—

Census Report, 1911. Fol. 1912. (The Colonial Office, London.)

Union of South Africa—

Census of 1911. Report. Fol. Pretoria, 1913. (The Director, Census Office.)

(c) **United Kingdom and its several Divisions.****United Kingdom—**

Finance. Minutes of Evidence taken by Committee on Irish Finance, with Appendices. [Cd-6799.] 1913. (Purchased.)

Poor. Royal Commission on Poor Laws and relief of distress. Appendix vol. 37. General Consolidated Index. [Cd-5443.] 1913. (The Commission.)

(d) **Authors, &c.***Andersson (Thor)—*

De nya Mantalspenningarna. 48 pp., la. Svo. Stockholm, 1913. (The Author.)

Handelsstatistikens organisation. 16 pp., Svo. Stockholm, 1912. (*Id.*)

Socialstyrelsen. 67 pp., Svo. Stockholm, 1912. (*Id.*)

Socialstyrelsen och Försäkringsväsendet. 16 pp., Svo. Stockholm, 1912. (*Id.*)

Sveriges Utförsel från och med år 1886. 12 pp., 4to. Stockholm, 1912. (*Id.*)

Bochard, (A.). Les lois de la Sociologie économique. Systèmes et Faits Sociaux. 352 pp., Svo. Paris, 1913. (Marcel Rivière and Co.)

Channing (Sir Francis A., M.P.). The truth about Agricultural Depression. An Economic Study of the Evidence of the Royal Commission. xvi + 388 pp., sm. Svo. 1897. (The Author.)

Cunningham (George H.). The Increase in the National Death Rate from Heart Disease, Bright's Disease and Apoplexy. 29 pp., Svo. 1913. (*Id.*)

Del Vecchio (Gustavo)—

Relazioni fra entrata e consumo. 114 pp., Svo. Roma, 1912. (*Id.*)

Le variazioni periodiche dello sconto. 68 pp., Svo. Roma, 1913. (*Id.*)

Devavrin (Maurice) and Lecarpentier (Georges). La protection légale des travailleurs aux États-Unis, avec exposé comparatif de la législation française. 348 pp., Svo. Paris, 1913. (Marcel Rivière and Co.)

Dufour (M.). Le Syndicalisme et la Proclame Révolution. 436 pp., Svo. Paris, 1913. (*Id.*)

Gugol (Yves). L'A B C du Libre-Échange. vii + 209 pp., sm. Svo. Paris, 1913. (The Author.)

Hersch (L.). Le juif errant d'aujourd'hui. Etude sur l'émigration des Israélites de l'Europe orientale aux États-Unis de l'Amérique du Nord. 331 pp., Svo. Paris, 1913. (Giard and Brière.)

(d) **Authors, &c.—Contd.**

Hinckes (Ralph T.). The Farmers' Outlook. A review of home and overseas agriculture, 1880-1913. 140 pp., Svo. London, 1913. (The Author.)

Keynes (John Maynard). Indian Currency and Finance. viii + 263 pp., Svo. London, 1913. (Macmillan and Co.)

Levy (Hermann). Economic Liberalism. ix + 124 pp., Svo. London, 1913. (*Id.*)

Meissner (Otto). Wahrscheinlichkeitsrechnung nebst Anwendungen. 64 pp., sm. Svo. Leipzig, 1912. (Purchased.)

Parkinson (Rt. Rev. Monsignor Henry), D.D. Primer of Social Science. xii + 276 pp., Svo. London, 1913. (P. S. King and Son.)

Ricci (Prof. Umberto)—

Statistique Internationale des états des Cultures. 92 pp., Svo. The Hague, 1913. (The Author.)

Das Statistische Bureau des Internationalen Landwirtschaftlichen Institutes. 34 pp., Svo. Brunn, 1912. (*Id.*)

Robinson (M. Fothergill). The spirit of association, being some account of the guilds, friendly societies, co-operative movement and trade unions of Great Britain. xii + 403 pp., Svo. London, 1913. (Mr. John Murray.)

Rosenraad (C.). Highest and lowest rates of exchange on London during the first half year of 1913 on 21 of the principal Money Markets. Sheet. (The Author.)

Savorgnan (Franco). Il fattore confessionale nella scelta matrimoniale. 32 pp., Svo. Rome, 1913. (*Id.*)

Zahnbrecher (Dr. Franz Xaver). Lohnstatistik. 72 pp., Svo. Nürnberg, 1913. (*Id.*)

Britannica Year-Book, 1913. A survey of the world's progress since the completion in 1910 of the Encyclopædia Britannica. 11th edition. Svo. 1913. (Purchased.)

Catholic Studies in Social Reform. II. Sweated Labour and the Trade Boards Act. Edited by the Rev. Thomas Wright. 2nd edition. 78 pp., Svo. London, 1913. (P. S. King and Son.)

— V. First notions on social service. Edited by Mrs. Philip Gibbs. 80 pp., Svo. London, 1913. (*Id.*)

Christian Social Union, Oxford University Branch. Leaflets 64-71, dealing with wages and cost of living, &c. Svo. Oxford, 1913. (The Rev. J. Carter, M.A.)



ANNUAL LIST OF ADDITIONS TO THE LIBRARY.

Since July 7, 1912, the Society has received the periodical publications enumerated below. They are arranged alphabetically by subjects (works of a general nature coming first) under the following heads :—(a) Foreign Countries ; (b) India and Colonial Possessions ; (c) United Kingdom and its Divisions ; (d) Societies, &c. (British) ; (e) Periodicals, &c. (British).

(a) Foreign Countries.

Argentine Republic—

Argentine Year-book for 1912 and 1913. Year-book of Direction General of Statistics, Vols. 2 and 3 of 1909. Vols. 1, 2, and 3 of 1910. Vol. 1 of 1911. Agricultural Statistics for 1910-11. Trade Returns (quarterly) for 1912-13.

Cordoba (Province). Statistical Year-book for 1911. Agricultural Statistics for 1910-11.

Austria-Hungary—

Railway Returns for 1911. Trade Returns for 1911. Report of Permanent Commission for Custom Values for 1911. "Compass" Financial Year-book for 1913.

Austria—

Statistical Hand-book for 1911. Agricultural Statistics for 1912. Births, Deaths, and Marriages, Statistics of, for 1910. Education Statistics for 1908-09. Financial Statistics for 1911-12. Judicial Statistics for 1910. Labour. Strikes and Lockouts in 1911. Overtime in Factories and Workshops in 1911. Arbitration in Labour Disputes in 1910. Mineral Statistics for 1910 and 1911. Miners Sickness Statistics for 1910. Postal Statistics for 1911. Savings Banks Statistics for 1909-10.

Bosnia and Herzegovina. Trade Returns for 1911.

Belgium—

Statistical Year-book for 1911. Army Medical Statistics for 1911. Budget of Receipts of Payments for 1911. Labour, Year-book of Labour Legislation for 1911. Report on Factory Inspection in 1911. Railway Returns for 1909. Trade Returns for 1911.

Brussels. Annual Health Report for 1911.

Liège. Report on Improved Housing for the Working Classes in 1912. Year-book of Royal Academy of Belgium for 1913.

Brazil—

Rio Grande do Sul. (State) Bulletin of Statistics for 1910 and 1911. Report of the Statistical Department for 1911.

Chile—

Statistical Year-book. Vols. 2 and 3 of 1910, and for 1911. Agricultural Statistics for 1910-11. Trade Returns for 1911.

China—

List of Lighthouses, &c., 1913. Post Office Report for 1911. Trade Returns for 1911.

Colombia—

Bulletin of the Ministry of Foreign Relations for 1912.

Cuba—

Bulletin of Ministry of Agriculture for 1912. Trade Returns for year 1910-11. Financial Statistics of the Province of *Oriente* and certain towns for year 1911-12.

(a) Foreign Countries—Contd.

Denmark—

Statistical Year-book for 1912. Statistical Miscellany, 1912-13. Trade Returns for 1911.

Copenhagen. Annual Health Report for 1911.

Egypt—

Statistical Year-book for 1912. Cotton Crop Monthly Statistics for 1912. Financial Report on Public Department for 1912. Postal Report for 1912. Public Health and Vital Statistics for 1911-12. Trade and Navigation Returns for 1912. Report of Committee for Preservation of Monuments of Arabic Art for 1911. *L'Egypte Contemporaine* for 1912.

France—

Statistical Year-book for 1910 and 1911. Bulletin of General Statistics, 1912-13. Budget for 1912. Inland Navigation Statistics for 1911. Judicial Statistics, Civil for 1909, Criminal for 1910. Labour Statistics (Strikes) for 1910 and 1911. Mineral Statistics for 1911. Mint Report for 1912. Poor Relief Statistics for 1909 and 1910. Railway Statistics, Local for 1909, General for 1910. Trade and Navigation Returns for 1911. Bank of France Report for 1912.

Colonies. Trade and Navigation Returns for 1910.

Paris. Statistical Year-book for 1910. Statistical Society Journal and Year-book for 1912-13. British Chamber of Commerce, Annual Report for 1912.

Germany—

Statistical Year-book for 1912. Agricultural Co-operative Returns for 1911. Inland Navigation Returns for 1910 and 1911. Insurance Returns (Accident, Old Age, and Sickness) for 1911 and 1912. Joint Stock Companies' Returns for 1910-11. Judicial Statistics (Criminal) for 1910. Labour Statistics (Strikes and Lockouts) for 1912. Municipal Statistical Year-book of German Towns dated 1912. Trade and Navigation Returns for 1911.

Baden. Statistical Year-book for 1912.

Prussia. Statistical Year-book for 1912. Co-operative Credit Bank Returns for 1910.

Saxony. Statistical Year-book for 1912.

Wurtemberg. Statistical Year-book dated 1912.

Berlin. Sickness Insurance Returns for 1911. German Actuarial Society, Report for 1912.

Düsseldorf. Annual Statistics for 1912.

Frankfort. Vital Statistics for 1912. Annual Reports of the Geographical and Statistical Society for 1910-12.

Hamburg. Trade and Navigation Returns for 1911.

Wiesbaden. Statistical Year-book for 1911.

Honduras—

The Economic Review, 1912-13.

Hungary—

Statistical Year-book for 1911. Navigation Returns of Fiume for 1910. Trade Returns for 1911.

Italy—

Statistical Year-book for 1912. Births, Deaths, and Marriages, Statistics of, for 1910. Causes of Death, Returns of, in 1910. Judicial Statistics, Civil and Criminal, for 1907.

Florence. Year-book of the "Cesare Alfieri" Institute of Social Science for 1912-13.

Turin. Year-book of the Municipality for 1911-12.

Venice. Bulletins of Statistics for 1912-13.

(a) **Foreign Countries—Contd.****Japan—**

Statistical Abstract dated 1912. Financial and Economic Annual for 1912. Births, Deaths and Marriages in 1909. Causes of Death in 1909.

Luxemburg—

Agricultural Statistics for 1911 and 1912.

Mexico—

Statistical Year-book for 1907. Bulletin of the "Direction" General of Statistics for 1913. Year-book of Fiscal Statistics for 1911-12. Geographical and Statistical Society of Mexico: Bulletins for 1912-13.

Netherlands—

Statistical Year-book for 1911. Births, Deaths and Marriages in 1911. Causes of Death in 1911. Bankruptcy Statistics for 1911. Finance (State and Municipal) Statistics for 1910. Judicial Statistics (Criminal) for 1910. Labour Statistics for 1911. Poor Relief Statistics for 1910. Prison Statistics for 1911. Public Health Report for 1911. Trade and Navigation Returns for 1911.

Norway—

Statistical Year-book for 1912. Army Recruiting Statistics for 1911. Education Statistics for 1909. Fisheries (Sea) Statistics for 1911. Statistics of Industries for 1910. Insurance (Accident) Returns for 1909. Judicial Statistics (Civil) for 1910. Labour Bulletins for 1910. Lunacy Statistics for 1910 and 1911. Mines and Factories, Statistics for 1910. Municipal Financial Returns for 1908. Postal Statistics for 1911. Prison Statistics for 1908. Public Health Reports for 1910. Savings Banks Statistics for 1911. Telegraphs and Telephones, Statistics for 1910 and 1911. Trade Returns for 1911 and Navigation Returns for 1910. Veterinary Service Report for 1910. Vital Statistics for 1908 and 1909.

Christiania. Public Health Report for 1911.

Paraguay—

Official Bulletin for 1911-12.

Portugal—

Statistical Year-book of direct Taxation for 1910 and 1911. Alcohol, Statistics of Consumption of, 1908-11. Commercial and Maritime Bulletin for 1912. Emigration Returns for 1911. Trade and Navigation Returns for 1909 and 1910.

Roumania—

Statistical Bulletin, 1912.

Russia—

Russian Year-book for 1913. Statistical Year-book for 1908. Year-book of Department of Agriculture for 1912. Year-book of Ministry of Finance for 1912. Proposed Budget for 1913. Part I. Trade Returns for 1911.

St. Petersburg. Statistical *résumé* for 1911.

Moscow. Statistical Bulletin, 1912-13.

Finland. Statistical Year-book for 1912. Emigration Returns for 1911. Poor Relief Statistics for 1909. Savings Bank Statistics for 1911. Trade and Navigation Returns for 1911.

Servia—

Statistical Year-book for 1907 and 1908. Trade returns for first quarters of 1911 and 1912.

Spain—

Agricultural Statistics for 1912. Labour: Statistics of Industrial Accidents in 1910 and 1911. Trade Returns for 1911. Customs and Taxation Returns for 1912.

Madrid. Abstract of Vital Statistics for 1909.

(a) Foreign Countries—*Contd.***Sweden—**

Annual Statistics for 1911-12 dealing with:—Agriculture, Banks, Emigration, Finance (State and Local), Fire Insurance, Forests, Health of Army and Navy, Industries, Labour, Land Surveys, Lunacy, Mines, Pilotage, &c., Poor Relief, Postal, Prisons, Railways, Savings Banks, Social Insurance, Telephones and Telegraphs, and Trade and Navigation. The "Statistisk Tidskrift" for 1912-13. The publications of the series "Bidrag till Sveriges Officiella Statistik."

Stockholm. Statistical Year-book for 1910-12. Report on health of Stockholm for 1911.

Switzerland—

Statistical Year-book for 1912. Alcohol, Statistics of the *Régie des Alcools* for 1911. Army Recruits, Report on Education of, for 1911. Assurance Companies, Reports on, for 1910 and 1911. Trade Returns for 1911 and 1912. Report on Commerce and Industry of Switzerland in 1911.

Bern (Canton). Agricultural Statistics for 1910 and 1911. Finance Statistics for 1910. Prices of Meat in Towns in 1912.

United States—

Agricultural Statistics for 1911-12. Bulletins and Circulars of the Department of Agriculture, 1912-13. Census Bureau, Mortality Statistics for 1909. Education, Report of Commissioner for 1910-11. Vol. 2. Finance, Report of Comptroller of Currency for 1911-12. Immigration, Report of Commissioner General for Year 1911-12. Library of Congress, Report on, for 1911-12. Mineral Statistics for 1911. Mint, Report of Directors for 1911-12. Navigation, Reports of Commissioner of, for 1908-12. Naval Observatory Report for 1911-12.

Connecticut. Vital Statistics for 1911.

Illinois. Coal Report for 1912. Free Employment Offices, Report on, for 1911-12.

Massachusetts. Health Report for 1910-11. Labour Statistics for 1911-12. Manufactures, Statistics of, for 1910 and 1911.

Minnesota. Labour Reports for 1911.

Nebraska. Crop Statistics, 1912.

New York (State). Reports and Statistics of Department of Labour for 1910-11.

Ohio. Labour Statistics for 1912.

Pennsylvania. Labour Statistics for 1911.

Boston. Report of Executive Department for 1910. Financial Statistics for 1907-11. Municipal Register for 1912.

Chicago. Board of Trade Report for 1912. John Crerar Library Report for 1912.

New York. Carnegie Foundation Annual Report for 1912.

Uruguay—

Vital Statistics for 1911 and 1912.

Montevideo. *Résumé* of Municipal Statistics for 1911.

Venezuela—

Statistical Year-book for 1909. Trade and Navigation Returns for 1911-12.

International—

International Agricultural Institute, Publications, 1912-13. International Labour Office, Bulletins, 1912-13. International Statistical Institute, Bulletins and other Publications, 1912-13. International Association for Prevention of Unemployment, Bulletins, 1912-13. International Federation of Master Cotton Spinners, Publications, 1912-13. Year Book of International Co-operation, 1913.

(b) India and Colonial Possessions.

India, British—

Statistical Abstract for 1910-11. Statistics of British India for 1910-11 (issued in parts). Agricultural Statistics for 1910-11. Mineral Statistics for 1911. Moral and Material Progress in 1910-11. Prices and Wages for 1911 and earlier years. Railway Returns for 1911. Sanitary Measures in 1910-11. Tea Production in 1911. Trade and Navigation (Inland and Foreign) Returns for 1911-12.

Assam. Administration Report for 1911-12.

Bengal. Trade Returns for 1911-12. Administration Report for 1910-11.

Punjab. Public Health Report for 1911.

East India Railway. Reports, 1912.

Australia, Commonwealth of—

Official Year-book of the Commonwealth, No. 5, 1901-11. Monthly Statistical Summary, 1913. Parliamentary Debates, Session 1911-12. Bulletins dealing with Finance, Production, Population and Vital Statistics, Social Statistics and Transport. Trade and Navigation Returns for 1911.

New South Wales. Official Year-book for 1911. Statistical Register for 1910 and 1911. Friendly Societies Report for 1911. Mines Department, Report for 1911. Prisons Report for 1911. Railways and Tramways, Report on, for 1911-12. Vital Statistics for 1911.

Queensland. Statistics of Queensland for 1911. Agricultural Statistics for 1911. Vital Statistics for 1911.

South Australia. Statistical Register for 1911. Agricultural Statistics for 1911-12. Public Library and Museum, &c., Report for 1911-12. Manufactures, &c., Returns of, for 1911. School of Mines, Report for 1911. Vital Statistics for 1911.

Tasmania. General Statistics of the State for 1910-11. Railway Returns for 1911-12.

Victoria. Victorian Year-book for 1911-12. Statistical Register for 1910 (in parts). Friendly Societies Report for 1911. Public Library and Museum, &c., Report for 1910-11.

Western Australia. Statistical Register for 1910 and 1911 (in parts). Friendly Societies, Returns of, for 1911-12. Industrial Conciliation and Arbitration Proceedings in 1911-12. Mines Report for 1911.

Canada, Dominion of—

Canada Year-book for 1911. Agriculture, Department of, Statistical Publications, 1910-11. Auditor-General's Report for 1911-12. Banks, Unclaimed Balances, 1911. Building Societies Report for 1910. Census and Statistics Monthly for 1913. Customs, Report of Department of, for 1911-12. Labour Statistics for 1912. Public Accounts for 1911-12. Trade Returns for 1911-12.

Alberta. Agricultural Report for 1911.

British Columbia. Mineral Statistics for 1911.

Manitoba. Journals, &c., of Legislative Assembly, 1912. Statutes of Manitoba, 1912.

Ontario. Agricultural Department Publications, 1912. Bureau of Industries, Annual Report for 1911.

Saskatchewan. Report of Department of Agriculture for 1911. Public Service Monthly, 1912.

Canada Life Office, Annual Report, 1912.

Royal Society of Canada, Proceedings, 1912.

Royal Bank of Canada, Report for 1912.

Ceylon—

Administrative Reports for 1911-12. Blue Book for 1911-12. Papers laid before Legislative Council, 1911-12. Vital Statistics for 1911.

Jamaica—

Vital Statistics for 1911-12.

(b) India and Colonial Possessions—*Contd.***Mauritius—**

Blue Book for 1911.

New Zealand—

Official Year-book, 1912. Statistics of the Dominion for 1910 and 1911.
Labour Reports, 1912. *Wellington* Harbour Board Accounts, 1911-12.
New Zealand Institute, Proceedings, 1911.

Rhodesia—

Rhodesia Chamber of Mines, Annual Reports, 1912.

Uganda Protectorate—

Blue Book for 1911-12.

Union of South Africa—

Agricultural Journal, 1912. Mines, Reports of Department of, for 1911.
Trade and Navigation Returns for 1912 (also monthly).
Transvaal. Chamber of Mines, Report for 1911.
Johannesburg. Chamber of Commerce Commercial Year-book, 1913.

(c) United Kingdom and its several Divisions.

United Kingdom—

Statistical Abstracts for the British Empire, the United Kingdom, the Colonies, and for Foreign Countries for 1911-12. Statistical Tables for Colonies. Annual or other Reports or Returns dealing, among other subjects, with the Army, Bankruptcy, Building Societies, Coal Tables, Colonial and Foreign Import Duties, Companies, Customs and Excise, Emigration, Factories and Workshops, Finance, Friendly Societies, Inland Revenue, Labour, Merchant Shipping, Mines and Quarries, Mint, Railways, Railway Accidents, Trade and Navigation, Traffic, Woods and Forests, Wrecks.

Great Britain—

The publications of the Board of Agriculture and Fisheries, and of the Board of Agriculture for Scotland.

England and Wales—

Annual and other Reports dealing, among other subjects, with:—Births, Deaths and Marriages, Charities, Census of 1911 as published, Ecclesiastical Commission, Education, Justice, Local Government Board, Local Taxation, Pauperism, Police.

London County Council. Annual Report of the Council for 1911. London Statistics for 1911-12. Statistical Abstract for 1911-12.

Metropolitan Asylums Board. Report for 1911.

Metropolitan Water Board. Report for 1911.

Central (Unemployed) Body for London, Report for 1911-12.

Acton. Accounts for 1911-12.

Battersea. Report of Council for 1911-12.

Islington. Accounts for 1911-12.

Paddington. Report of Medical Officer for 1911.

Poplar. Report of Medical Officer for 1911.

Wandsworth. Report of Council for 1911-12.

Municipal Accounts for 1911-12 of Birmingham, Folkestone, Hull, Ipswich, Leicester, Manchester and Nottingham.

Reports of Medical Officers of Health for 1911, of Birkenhead, Birmingham, Bristol, Chester County, Derby, Halifax, Liverpool, Manchester, Newport, Norwich, Preston, Salford, Wigan and Wolverhampton.

Calendars for 1912-13, of the Universities of Birmingham, Bristol, Durham, Leeds, Liverpool, London, Manchester, Sheffield, University Colleges of Wales and South Wales.

(c) United Kingdom and its several Divisions—Contd.**Ireland—**

Publications of Department of Agriculture and Technical Education, and, among others, those relating to Births, Deaths and Marriages, Census 1911, Education, Emigration, Justice, Fisheries, Local Government and Taxation, Lunacy and Reformatories.

Calendars for 1912-13 of Universities of Belfast and Dublin.

Scotland—

Annual and other Reports or Returns dealing, among other subjects, with Births, &c., Education, Justice, Local Government and Taxation, Lunacy and Prisons.

Edinburgh. Municipal Accounts for 1912.

Reports of Medical Officers of Health for 1911, of Edinburgh, Aberdeen and Glasgow.

Calendars for 1912-13 of the Universities of Aberdeen, Edinburgh and Glasgow.

(d) Societies, &c. (British).

British Association, Report, 1912. Corporation of Foreign Bondholders, Report, 1912. Institute of Chartered Accountants in England and Wales, List of Members, 1912. Jews, Board of Guardians for Relief of Jewish Poor, Annual Report for 1912. Jews, Annual Report and Accounts of United and Constituent Synagogues for 1912. Liverpool, Incorporated Chamber of Commerce, Annual Report, 1912. Manchester Statistical Society, Transactions. Peabody Donation Fund, Report of Governors for 1912. Royal Agricultural Society of England Journal. Royal College of Physicians of London, List of Fellows, &c., 1913. Royal College of Surgeons of England, Calendar, 1912. Royal Philosophical Society of Glasgow, Proceedings. Society for Propagation of Gospel in Foreign Parts, Report for 1911. University College, Calendar, session 1912-13.

(e) Periodicals, &c., and Miscellaneous (British).

Alliance Year-book for 1912. Brewers' Almanack and Wine and Spirit Trade Annual for 1913. Licensed Victuallers' Official Annual, 1913. Newspaper Press Directory for 1913. Post Magazine Almanack for 1913. Statesman's Year-book, 1913. Stock Exchange Official Intelligence for 1913. Banking Almanac for 1913. Bourne's Insurance Directory, 1913. British Almanac and Companion, 1913. Burdett's Hospitals and Charities, 1913. Clergy List, 1913. Daily Mail Year-book for 1913. Hazell's Annual, 1913. Imperial Tariff, 1913. Insurance Register, 1913. Insurance Year-book, 1913. Municipal Year-book for 1913. Shipping World Year-book, 1913. Times, Annual Index for 1913. Whitaker's Almanack for 1913. Who's Who, 1913. Who's Who Year-book, 1913. Year-book of Learned Societies, 1912. Ellison's Cotton Trade Circulars, 1912-13. S. Figgis and Co., Annual Review of India Rubber Market, 1912. Thos. Gooch and Sons, Importation of Colonial and Foreign Wool into London, Liverpool, Hull, and other Ports, 1912. Maclean and Henderson, Review of Insurance Share Market in 1912. W. O. Müller and Co., Annual Report of Leaf-Tobacco Market for 1912. Pixley and Abell, Annual Circular relating to Imports and Exports and prices of Bullion for 1912. Helmuth, Schwartze and Co., Annual Report on Wool for 1912. William Tattersall's Cotton Trade Circulars for 1912-13. W. Weddel and Co., Annual Review of Frozen Meat Trade, 1912. South Wales Coal Annual for 1913. United Patternmakers' Association, Monthly Trade Reports, 1912-13. United Society of Boilermakers and Iron Ship-builders, Monthly Reports, 1912-13.

The weekly, monthly, or quarterly issues of the following returns have also been received during the same period:—

Agricultural Reports—From Argentina, Austria-Hungary, Cuba, France, United States, Canada, Transvaal, and United Kingdom.

Labour Reports, &c.—From Austria-Hungary, Belgium, France, Germany, Italy, Norway, Sweden, United States, Massachusetts and New York States, Canada, New Zealand, and United Kingdom.

Trade and Navigation Returns—From Argentina, Austria-Hungary, Belgium, Bulgaria, China, Egypt, France, Germany, Greece, Italy, Mexico, Netherlands, Russia, Spain, Sweden, Switzerland, United States, India, Australia, British South Africa, and United Kingdom.

Vital Statistics—From Egypt, Germany, Italy, Netherlands, Roumania, Switzerland, United States (California, Connecticut, and Michigan only), the Australian Commonwealth, South Australia and United Kingdom.

Vital Statistics of following Towns—Buenos Ayres, Buda-Pesth, Brünn, Prague, Brussels, Copenhagen, Berlin, Bucharest, St. Petersburg, Moscow, Madrid, Stockholm, Montevideo, London, Dublin, Edinburgh, and Aberdeen.

The weekly, monthly, quarterly or annual issues of the following periodicals, &c., have also been received during the same period. They are arranged under the countries in which they are published:—

Austria-Hungary—Statistische Monatschrift.

Belgium—Académie Royale. Bulletin de la Classe des Lettres, &c.

Brazil—Brazilian Review.

Denmark—Nationalökonomisk Tidsskrift.

France—Ministère des Finances. Bulletin de Statistique et Législation comparée. Monthly Circular of British Chamber of Commerce (Paris). Circulaire Commerciale des Métaux et Minéraux de Maurice Duclos. Revue des Sciences Politiques. Économiste Français. Journal des Economistes. Monde Économique. Polybiblion, Parties Littéraire et Technique. Réforme Sociale. Le Rentier. Revue d'Économie Politique. Journal de la Société de Statistique de Paris.

Germany—Vierteljahrshefte zur Statistik des Deutschen Reichs. *Prussia*—Zeitschrift des K. Preussischen Statistisches Landesamts. *Saxony*—Zeitschrift des K. Sachsichen Statistisches Landesamts. *Berlin*—Preis Zusammenstellungen des Stat. Amts der Stadt. *Düsseldorf*—Statistische Monatsberichte der Stadt. Deutsches Statistisches Zentralblatt. Archiv für Rassen- und Gesellschafts-Biologie. Archiv für Sozialwissenschaft und Sozialpolitik. Jahrbuch für Gesetzgebung, Verwaltung, und Volkswirtschaft. Jahrbücher für Nationalökonomie und Statistik. Zeitschrift für die gesamte Staatswissenschaft. Zeitschrift für die gesamte Versicherungs-Wissenschaft. Zeitschrift für Sozialwissenschaft.

Italy—L'Economista. Giornale degli Economisti. Rivista Italiani di Sociologia. Riforma Sociale.

Japan—Financial and Economic Monthly. Journal of the Statistical Society of Tokio.

Mexico—Bolletín de Estadística Fiscal. (Monthly and Annual.)

Netherlands—Revue Mensuelle du Bureau central de Statistique.

Norway—Journal du Bureau Central de Statistique.

Roumania—Moniteur Commercial Roumain. Buletinul Serviciului Statistic.

San Salvador—Boletín del Consejo superior de salubridad.

Sweden—Banking Returns. *Ekonomisk Tidskrift*.

Switzerland—*Journal de Statistique suisse*.

United States—Circulation Statements. Statements of Public Debt and Cash in the Treasury. *New York City*—Public Library Bulletin. *Boston*—Monthly Bulletin of Statistics Department. *American Journal of Sociology*. *American Underwriter*. *Commercial America*. *Bankers' Magazine*. *Bradstreet's*. *Commercial and Financial Chronicle*, with supplements. *Duns' Review*. *Journal of Political Economy*. *Political Science Quarterly*. *Quarterly Journal of Economics*. *Yale Review*. *American Academy of Political and Social Science*, *Annals*. *American Economic Association*, *Publications*. *American Statistical Association*, *Quarterly Publications*. *American Philosophical Society*, *Proceedings and Transactions*. *Columbia University*, *Studies in History*, &c. *University of California Chronicle*.

India—Cotton Spinning and Weaving in Indian Mills. *Indian Trade Journal*. *Indian Engineering*. *Paludism*.

Canada—Monthly Reports on Chartered Banks.

New Zealand—Government Insurance Recorder. *Trade Review and Price Current*.

Straits Settlements—Perak Government Gazette. *Federated Malay States Government Gazette*.

Transvaal—Chamber of Mines. *Monthly Analysis of Gold Production*. *Mines Department Statistics for each Month*. *Johannesburg*—Chamber of Commerce, *Monthly Report*.

Rhodesia—Chamber of Mines, *Output of Gold and other Metals and Coal*. *Chamber of Mines, Report of Executive Committee*.

United Kingdom—The Accountant. *Accountants' Magazine*. *Accessions to the War Office Library*. *Agricultural Economist*. *Associated Accountants' Journal*. *Athenæum*. *Australasian World*. *Bankers' Magazine*. *Biometrika*. *Board of Agriculture, Journal*. *Board of Trade, Journal*. *Broomhall's Corn Trade News*. *Browne's Export List*. *Colliery Guardian*. *Commercial World*. *Co-partnership*. *Economic Journal*. *Economic Review*. *Economist*. *Eugenics Review*. *Fireman*. *Finance Chronicle*. *Financial Review of Reviews*. *Illuminating Engineer*. *Insurance Record*. *Investors' Monthly Manual*. *Joint Stock Companies' Journal*. *Journal of Irish Department of Agriculture and Technical Instruction*. *Licensing World*. *London County Council, Gazette*. *Machinery Market*. *National Temperance Quarterly*. *Nature*. *Navy League, Journal*. *Policy*. *Policy-Holder*. *Post Magazine*. *Public Health*. *Publishers' Circular*. *Returns of Pauperism*. *Sanitary Record*. *The Secretary*. *Shipping World*. *Statist*. *The Times*. *Wallis Index numbers*. *Women's Industrial News*. *Royal Anthropological Institute, Journal*. *East India Association, Journal*. *Howard Association, Leaflets, &c*. *Imperial Institute, Journal*. *Institute of Actuaries, Journal*. *Faculty of Actuaries, Transactions*. *Institute of Bankers, Journal*. *Institution of Civil Engineers, Minutes of Proceedings*. *Iron and Steel Institute, Journal*. *Lloyd's Register of British and Foreign Shipping, Statistical Tables*. *London Chamber of Commerce, Journal*. *London University Gazette*. *Royal Agricultural Society, Journal*. *Royal Asiatic Society, Journal*. *Royal Colonial Institute, United Empire*. *Royal Geographical Society, Geographical Journal*. *Royal Institution, Proceedings*. *Academy, Proceedings and Transactions*. *Royal Meteorological Society, Meteorological Record and Quarterly Journal*. *Royal Society, Proceedings*. *Royal Society of Edinburgh, Proceedings and Transactions*. *Royal United Service Institution, Journal*. *Sanitary Institute, Journal*. *Society of Arts, Journal*. *Society of Comparative Legislation, Journal*. *Statistical and Social Inquiry Society of Ireland, Journal*. *Surveyors' Institution, Professional Notes and Transactions*. *Trade Circulars*.

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1913		Butler, Dr. William, <i>26, Craven Park-road, Harlesden, N. W.</i>
1892		Byworth, Charles J., F.S.A.A., <i>The Limes, Sutton Common-rd., Benhilton, Surrey.</i>
1912	d	Cahill, J. R., <i>c/o Messrs. Holt & Co., 3, Whitehall-place, S. W.</i>
1902	d	Caillard, Sir Vincent H. P., <i>42, Half Moon-street, W.</i>

Year of Election.		
1897		Cairnes, Frederick E., <i>Killester House, Raheny, Co. Dublin.</i>
1911	<i>d</i>	Callie, J. W. S., <i>18. Hackin's Hey, Liverpool.</i>
1911		Campbell, A. R.,
1911		Campbell, Charles W., C.M.G., <i>27, Courtfield-road, South Kensington, S.W.</i>
1905	<i>d</i>	Campbell, Richardson, <i>37, Lansdowne-road, Crumpsall, Manchester.</i>
1879		Campbell-Colquhoun, Rev. John E., <i>Churtwell, Westerham, Kent.</i>
1889	<i>d p</i>	Cannan, Prof. Edwin, M.A., LL.D., <i>11, Chadlington-road, Oxford.</i>
1891	<i>d</i>	Cannon, Henry W., <i>Chase National Bank,</i> <i>83, Cedar-street, New York, U.S.A.</i>
1900	<i>d</i>	Canovai, Commendatore Tito, <i>Bank of Italy, Rome.</i>
1904		Carrington, John B., F.S.A.A., <i>20, Blomfield-road, Maida Vale, W.</i>
1910		Carr-Saunders, A. M., M.A., <i>Milton Heath, Dorking.</i>
1910		Carson, H. C., <i>193, Jackson-street, W., Hamilton, Canada.</i>
1890		*Carter, Eric M., A.I.A., F.C.A., <i>33, Waterloo-street, Birmingham.</i>
1883	<i>d</i>	*Carter, Joseph R., <i>Old Hall, Wallington, Surrey.</i>
1911		Cassel, Felix, K.C., M.P., <i>25, Bryanston-square, W.</i>
1907		*Chabot, Marius T., <i>34, Westersingel, Rotterdam, Holland.</i>
1913		Chadwick, Percy, <i>98, Huntingdon-road, East Finchley, N.</i>
1884	<i>d</i>	*Chailley, Joseph, <i>Député Union Coloniale Française,</i> <i>17, Rue d'Anjou, Paris.</i>
1880		*Chamberlain, The Right Hon. Joseph, M.P., F.R.S., <i>Highbury, Moor Green, Birmingham.</i>
1901	<i>d p</i>	Chance, Sir William, Bart., J.P., <i>Orchards, near Godalming.</i>
1913		Chapman, E. H., M.A., B.Sc., <i>"Peveril," Starkholmes-lane, Matlock.</i>
1886	<i>d p</i>	*Chapman, Samuel, <i>Billiter-buildings, Billiter-street, E.C.</i>
1903	<i>c d p</i>	*CHAPMAN, PROFESSOR SYDNEY J., M.A., <i>Owens College, Manchester.</i>
1901	<i>d</i>	Chapman, Walter W., <i>4, Mowbray House, Norfolk-street, Strand, W.C.</i>
1904		Charles, Thomas E., <i>52, Sandrock-road, Lewisham, S.E.</i>

Year of Election.		
1888		*Charnwood, The Right Hon. Lord, 108, <i>Eaton-square</i> , S. W.
1913		Chaston, John, " <i>London</i> ," <i>Round Hill-road</i> , <i>Kettering</i> .
1892		*Chatham, James, F.I.A., F.F.A., 7, <i>Belgrave-crescent</i> , <i>Edinburgh</i> .
1912		Chen, Yi, <i>Auditor-General's Office</i> , <i>Peking</i> , <i>China</i> .
1903	d	Chiozza-Money, Leo G., M.P., <i>The Grey House</i> , <i>Hampstead-lane</i> , N.
1886	c d p	*Chisholm, George G., M.A., B.Sc., F.R.G.S., 12, <i>Halfhead-road</i> , <i>Edinburgh</i> .
1906		Choles, Herbert J., <i>Dept. of Agriculture</i> ; <i>Pretoria</i> , <i>South Africa</i> .
1910		Christian, Edward Alan, 24, <i>Park-road South</i> , <i>Birkenhead</i> .
1904		Clark, Prof. Arch. Brown, <i>University of Manitoba</i> , <i>Winnipeg</i> , <i>Canada</i> .
1909		Clark, Albert Hawkins, A.M.I.C.E., 58, <i>Elmbourne-road</i> , <i>Tooting Common</i> , S. W.
1909	d	Clark, Dr. Charles C., <i>Dept. of Agriculture</i> , <i>Office of the Secretary</i> , <i>Washington, D.C.</i> , U.S.A.
1901	c	Clark, William H., C.S.I., C.M.G., <i>Government House</i> , <i>Calcutta</i> , <i>India</i> .
1882	c d	*CLARKE, SIR ERNEST, 31, <i>Tavistock-square</i> , W. C.
1877	c d	*Clarke, Henry, L.R.C.P., <i>Courns Wood</i> , <i>Hughenden</i> , <i>High Wycombe</i> .
1890		Clarke, Henry, J.P., <i>Cannon Hall</i> , <i>Hampstead</i> , N. W.
1908		Clarke, John J., 48, <i>Laurel-road</i> , <i>Fairfield</i> , <i>Liverpool</i> .
1899		Claughton, Sir Gilbert H., Bart., <i>The Priory</i> , <i>Dudley</i> .
1908		Clay, Sir Arthur T. F., Bart., 19, <i>Hyde Park Gate</i> , S. W.
1907		Clements, Lieut.-Col. H. C., V.D., 3, <i>Campion-road</i> , <i>Putney</i> , S. W.
1911		Coates, Norman, <i>The Priory</i> , <i>Truro</i> .
1911	d	Coats, Robert Hamilton, B.A., <i>Department of Labour</i> , <i>Ottawa</i> , <i>Canada</i> .
1893	c d p	COGHLAN, TIMOTHY A., I.S.O., 123 and 125, <i>Cannon-street</i> , E. C.
1905		*Cohen, C. Waley, M.A., 11, <i>Hyde Park-terrace</i> , W.
1859		Coles, John, F.I.A., 4, <i>Kensington Park-gardens</i> , W.
1905		Coles, Richard J., F.C.I.S., <i>Addenbrooke's Hospital</i> , <i>Cambridge</i> .

Year of Election.		
1913		Collard, William, 120, <i>St. Julian's Farm-rd., West Norwood, S.E.</i>
1892	d p	*Collet, Miss Clara E., M.A., <i>Board of Trade, Gwydyr House, Whitehall, S.W.</i>
1895		Collins, Howard J., <i>The General Hospital, Birmingham.</i>
1906		Collins, Percy, 81-83, <i>Cheapside, E.C.</i>
1882		*Collum, Rev. Hugh R., M.R.I.A., F.R.C.I., 35, <i>Oakley-street, Chelsea, S.W.</i>
1912	d	Conacher, H. M., 29, <i>St. Andrew-square, Edinburgh.</i>
1911		Constable, W. G., 17, <i>Denning-road, Hampstead, N.W.</i>
1911		Cook, Arthur James, A.I.A., M.J.I., 6, <i>Dorset-square, Regent's Park, N.W.</i>
1887		Cooke-Taylor, R. Whately, <i>High Trees, Chepstow.</i>
1888		*Cooke-Taylor, Theodore, J.P., <i>Sunny Bank, Batley, Yorkshire.</i>
1891	d	Cooper, Joseph, 27, <i>Kildare-street, Farnworth, near Bolton.</i>
1906		Cornish, George F., <i>New House, Knowle St. Giles, Chard, Somerset.</i>
1911		*Cory, Sir Clifford John, Bart., M.P., <i>Llantarnam Abbey, Monmouthshire.</i>
1899	d	Court, Stephen E., <i>Central Office for Unemployed Insurance, Queen Anne's Chambers, S.W.</i>
1862	c d p	COURTNEY, RIGHT HON. LORD (<i>Hon. Vice-President</i>). 15, <i>Cheyne Walk, Chelsea, S.W.</i>
1902		*Coxon, William, 15, <i>Elsworthy-terrace, N.W.</i>
1874	c d p	CRAIGIE, MAJOR P. G., C.B. (<i>Hon. Vice-President</i>), <i>Brenté House, Lymington, Devon.</i>
1910	p	Crammond, Edgar, 37, <i>Gorsehill-road, New Brighton, Cheshire.</i>
1902		Craven, Edward J. E., <i>Secretary's Office, H.M. Customs and Excise, Ocean House, E.C.</i>
1890	c d p	Crawford, Sir Richard F., K.C.M.G., <i>c/o F. R. Sneath, Esq., 1, New-court, Lincoln's Inn, W.C.</i>
1891		*Crawley, Charles E., <i>Lanhydrock Villa, Truro, Cornwall.</i>
1878		Crewdson, Ernest, <i>Grinstead, Green-lane, Burton, Derbyshire.</i>
1890		Croal, David O., <i>Financial News, 111, Queen Victoria-street, E.C.</i>
1911	d	Cunningham, George H., <i>Valley-cottage, New York, U.S.A.</i>
1883	c d	Cunningham, The Venble. Archdeacon, D.D., 2, <i>St. Paul's-road, Cambridge.</i>

Year of Election.		
1910		Dale, Augustus Charles, I.S.O., <i>Braemar Cottage, Maitland, Cape Town.</i>
1900		Dale, Charles E., F.S.A.A., <i>Old Culabar, West Africa.</i>
1910		Dalton, Hugh. <i>1. Cloisters, Temple, E.C.</i>
1898	d	*Danson, Francis C., <i>Tower Buildings, Water-street, Liverpool.</i>
1901	d	Danvers, Ernest, F.R.G.S., <i>B. Mitre 427, Buenos Ayres.</i>
1909		Darton, Oscar, F.C.A., <i>10, Old Jewry Chambers, London, E.C.</i>
1897	d p	*Darwin, Major Leonard, R.E., F.R.G.S., <i>12, Egerton-place, S.W.</i>
1913		Datta, Krishna Lal, M.A., <i>16/1, Ramkanta Bose-street, Calcutta, India.</i>
1901		Davies, Dixon H., <i>Great Central Ry., Marylebone Station, N.W.</i>
1869		Davies, James M., <i>168, St. Vincent-street, Glasgow.</i>
1888		Dawson, G. J. Crosbie, M.Inst.C.E., F.G.S., <i>May-place, Newcastle, Staffs.</i>
1899		Dawson, Mies M., F.A.S., F.I.A., <i>76, William-street, New York, U.S.A.</i>
1903	d	Dawson, Sidney S., F.C.A., F.C.I.S., <i>51, North John-street, Liverpool.</i>
1880		Debenham, Frank, <i>1, Fitzjohn's-avenue, Hampstead, N.W.</i>
1900	d	De la Plaza, Victorino, LL.D. (Buenos Ayres Ry. Co.), <i>Poste Restante, Buenos Ayres.</i>
1911	d	Denham, E. B., <i>66, Carzon-street, W.</i>
1907		Denman, Hon. Richard D., M.P., <i>35, Campden-hill-road, W.</i>
1891		Denne, William, <i>Lancaster Villa, Beltinge, Herne Bay.</i>
1873		Dent, Edward, <i>2, Carlos-place, Grosvenor-square, W.</i>
1887		Dent, George M., <i>20, Park-avenue, Southport.</i>
1889		De Rothschild, Leopold, D.L., <i>5, Hamilton-place, Piccadilly, W.</i>

Year of Election.		
1892		De Smidt, Henry, C.M.G., <i>Norham House, Belvedere-rd., Claremont, South Africa.</i>
1909	<i>d</i>	De Than, Baron Albin, 28, <i>Walton-street, Hans-place, S.W.</i>
1906		De Vine, John M., <i>Royal National Hospital for Consumption, Ventnor, Isle of Wight.</i>
1892		Dewar, William N., <i>c/o The Colonial Mutual Life Assurance Soc., Ltd., 33, Poultry, E.C.</i>
1900		Dewsnup, Professor Ernest R., M.A., F.R.G.S., <i>University of Illinois, Urbana, Ill., U.S.A.</i>
1906	<i>d</i>	*Dick, Godfrey W., A.I.A.N., <i>c/o P.O. Box No. 28, The Point, Port Natal, S. Africa.</i>
1908		Dickson, Professor Henry N., M.A., D.Sc., F.R.S.E., <i>The Lawn, Upper Redlands-road, Reading.</i>
1903		Digby, W. Pollard, 48, <i>Westminster Palace-gardens, Victoria-street, S.W.</i>
1899	<i>d</i>	Dougharty, Harold, A.I.A., F.C.I.S., "Ardnaree," <i>Stanthorpe-road, Streatham, S.W.</i>
1894	<i>c d p</i>	DRAGE, GEOFFREY, M.A., 29, <i>Cadogan-square, S.W.</i>
1897	<i>c d p</i>	DUDFIELD, REGINALD, M.A., M.B., 19, <i>Blomfield-road, Maida Vale, W.</i>
1895	<i>c</i>	Dudley, The Right Hon. The Earl of, <i>c/o John Tryon, Esq., 1, New-square, Lincoln's Inn, W.C.</i>
1909		Duffell, James H., A.I.A., <i>Royal London Mutual Ins. Soc., Ltd., Finsbury-square, E.C.</i>
1911		Dunbar, Alexander, <i>Board of Agriculture and Fisheries, 3, St. James's-square, S.W.</i>
1902	<i>c d</i>	Dunbar, Sir William C., Bart., C.B., 8, <i>Onslow-square, S.W.</i>
1908		Dungey, Miss M. E., B.Sc., <i>Glendower, Clinton-road, Redruth, Cornwall.</i>
1878	<i>c</i>	*Dunraven, The Right Hon. the Earl of, K.P., C.M.G., <i>Kenry House, Putney Vale, S.W.</i>
1910		*Duveen, Edward J., <i>Gangmoor, Hampstead Heath, N.W.</i>
1904		Dymant, Arthur F., <i>Rowantree House, Winchmore Hill.</i>
1888	<i>d</i>	Eckersley, J. C., M.A., F.R.G.S., <i>Carlton Manor, Yeadon, Leeds.</i>
1883	<i>c d p</i>	EDGEWORTH, PROF. FRANCIS Y., M.A., F.B.A. (President), <i>All Souls', Oxford.</i>

Year of Election.		
1910		Edwardes, Sydney, <i>5, Clive-street, Calcutta, India.</i>
1896	<i>p</i>	Edwards, C. Lewis, F.S.A.A., <i>" Santa Caterina," Loudwater, Bucks.</i>
1908		Eldridge, Ernest E. B., A.I.A., <i>39-41, New Broad-street, E.C.</i>
1908	<i>d</i>	Ellinger, Barnard, <i>Ashleigh, Buxton.</i>
1885	<i>c d p</i>	Elliott, Sir Thomas H., K.C.B., <i>The Royal Mint, Tower Hill, E.</i>
1885		Elliott, William, <i>Southern Life Office, Cape Town.</i>
1910	<i>d</i>	Eve, H. Trustram, <i>2, St. Paul's-square, Bedford.</i>
1896		Everett, Percy W., <i>Oaklands, Elstree, Herts.</i>
1877	<i>c d p</i>	EVERSLEY, THE RIGHT HON. LORD (<i>Hon. Vice-President</i>), 18, Bryanston-square, W.
1892		Faber, Harald, <i>Fiona, Lennard-road, Penge, S.E.</i>
1910		Fabini, Herman Victor, <i>22, Mincing-lane, E.C.</i>
1911		Faraday, W. B., LL.B., 6, <i>Fig Tree Court, Temple, E.C.,</i> <i>and " Lessenden," Budleigh Salterton, Devon</i>
1889	<i>d</i>	Farnworth, Edward J., F.S.A.A., <i>26, Winkley-square, Preston.</i>
1900	<i>d</i>	Farrer, The Right Hon. Lord, <i>Abinger Hall, Dorking.</i>
1890		Faulks, Joseph E., B.A., F.I.A., <i>83, Brondesbury-road, N. W.</i>
1893		*Fawcett, Mrs. M. G., <i>2, Gower-street, W.C.</i>
1882		Fell, Arthur, M.A., M.P., <i>46, Queen Victoria-street, E.C.</i>
1894		Fellows, Rowland H., F.I.A., <i>41, Montrose-avenue, Kilburn, N. W.</i>
1889		*Finlay, Major Alexander, <i>The Manor House, Little Brickhill, Bletchley.</i>
1900	<i>d</i>	Fisher, Professor Irving, Ph.D., <i>Yale University, New Haven, Conn., U.S.A.</i>
1888		Fisher, Sir Walter N., F.C.A., <i>4, Waterloo-street, Birmingham.</i>

Year of Election.		
1885		*Fitz-Gerald, Lt.-Col. Wm. G., M.A., F.R.Hist.S.,
1900	<i>d</i>	Fleming, Owen, Assoc. R.I.B.A., 3, <i>Warwick House-street, Charing Cross, S.W.</i>
1893	<i>c d p</i>	*FLUX, ALFRED W., M.A. (<i>Hon. Secretary</i>), <i>Board of Trade, Gwydyr House, Whitehall, S.W.</i>
1882		Foley, Patrick J., <i>Pearl Insurance Company, Adelaide-place, London Bridge, E.C.</i>
1889	<i>d</i>	Foot, Alfred, 19, <i>Seaforth-road, Westcliff-on-Sea, Essex.</i>
1893		Fortune, David, J.P., <i>Scottish Legal Life Assurance Society, 84, Wilson-street, Glasgow.</i>
1901		Foster, Harry S., D.L., <i>Grosvenor Mansions, 82, Victoria-street, S.W.</i>
1897	<i>c</i>	FOUNTAIN, HENRY, C.M.G., <i>Board of Trade, Whitehall-gardens, S.W.</i>
1878	<i>c d</i>	Foxwell, Professor H. Somerton, M.A., F.B.A., 1, <i>Harvey-road, Cambridge.</i>
1894		Francis, Joseph, 10, <i>Finsbury-square, E.C.</i>
1887		Frankland, Frederick W., F.I.A., " <i>Okataina</i> ," <i>Forton, Manawatu, N. Zealand.</i>
1899		Franklin, Arthur E., F.R.G.S., 35, <i>Portchester-terrace, W.</i>
1911		Fraser, Drummond Drummond, <i>Manchester and Liverpool District Bank, Manchester.</i>
1913	<i>d</i>	Fraser, Malcolm, Government Statistician, <i>Wellington, New Zealand.</i>
1902		Fremantle, Professor Henry E. S., <i>Library of Parliament, Cape Town.</i>
1911		Frewen, Moreton, <i>Brede Place, Sussex.</i>
1886		Fuller, George P., <i>Neston-park, Corsham, Wilts.</i>
1878		Fuller, William P., <i>Stone Lodge, Cheam, Surrey.</i>
1908		Furniss, Henry S., M.A., <i>Whirlow House, Oxford.</i>
1902	<i>d</i>	Gait, Edward A., C.S.I., C.I.E., I.C.S., <i>Census Commissioner for India, Simla, India.</i>
1852		Galsworthy, Sir Edwin H., J.P., 26, <i>Sussex-place, Regent's-park, N.W.</i>

Year of Election.		
1857	d	Gareke, Emile, <i>Electrical Federation Office, Kingsway, W.C.</i>
1910		Garnsey, Gilbert Francis, <i>3, Frederick's-place. Old Jewry, E.C.</i>
1909		Gaskell, Thomas Penn, M.I.C.E., <i>Townshend House, North-gate, Regent's-park, N.W.</i>
1904		*Gates, Chasemore P., <i>c/o Anglo-Chilian Nitrate and Railway Company, Tocopilla, Chile.</i>
1880		*Gates, John B., A.C.A., <i>The Old Mansion House, 73, Cheapside, E.C.</i>
1899	d	Gelling, Benjamin R., <i>Mutual Life Assn. of Australasia, Sydney, N.S.W.</i>
1907		Gemmill, William, F.I.A., <i>P.O. Box 809, Johannesburg, S. Africa.</i>
1909		Ghosh, Devendra Nath., B.A., F.R.E.S., Rai Sahib, <i>Dpty. Spndnt., Commercial Intell. Dept., 1, Council House-street, Calcutta.</i>
1885		Gibb, Sir George S., <i>By Caesar's Camp, Wimbledon Common, S.W.</i>
1900		Gladwell, Sydney W., <i>82, Victoria-street, S.W.</i>
1860	c d p	Glover, Sir John, J.P., <i>Highgate Lodge, West-hill, Highgate, N.</i>
1901	d	Godfrey, Ernest H., <i>Census and Statistics Office, Dept. of Trade and Commerce, Ottawa, Canada.</i>
1910		Goldman, C. S., M.P., <i>Salisbury House, E.C.</i>
1903		Goldman, Leopold, A.I.A., F.C.A., <i>N. American Life Assurance Co., 112-118, King-st. West, Toronto.</i>
1897	c d p	Gomme, Sir George L., F.S.A., <i>London County Council, Spring-gardens, S.W.</i>
1884	d p	*Gonner, Professor Edward C. K., M.A., <i>University College, Liverpool.</i>
1901		*Gooch, Henry C., <i>17, Oxford-square, W.</i>
1911		Goodship, Harold E., <i>Uganda State Rly., Nairobi, British E. Africa.</i>
1900	d	Goodsir, George, <i>c/o Messrs. Weddel & Co., 16, St. Helen's-pl., E.C.</i>
1892		Goodwin, Alfred, M.A., <i>2, Charles-road, St. Leonards, Sussex.</i>
1911		Gough, The Right Hon. Viscount, K.C.V.O., <i>9, Upper Belgrave-street, S.W.</i>
1893		*Gray, The Hon. James McL., M.A., F.R.G.S., <i>c/o R. Todd, 1, York-buildings, Adelphi, W.C.</i>
1904		*Gray, Robert K., <i>106, Cannon-street, E.C.</i>
1895	d	Green, John L., <i>2, Belmont-park, Lee, S.E.</i>
1902		Green, Walford D., M.A., <i>Huntley, Bishop's Teignton, S. Devon.</i>

Year of Election.		
1912		Greenwood, Arthur, B.Sc., 6, <i>West Hill, Huddersfield.</i>
1909	<i>c d p</i>	*GREENWOOD, MAJOR, M.R.C.S., L.R.C.P., "Hillcrest," <i>Church Hill, Loughton, Essex.</i>
1895		Gretton, John, M.P., <i>Stapleford Park, Melton-Mowbray.</i>
1911		Griffin, George Herbert, 24, <i>Essex-street, Strand, W.C.</i>
1911		Griffin, Harry Hewitt, M.J.L., <i>St. Oswald's, Putney, S.W., and Guildhall, E.C.</i>
1905		Gubbay, M. M. Simeon, B.A.,
1910		Gupta, Saratkumar Dutta, M.A., <i>Comptroller-General's Office, Delhi, India.</i>
1878		Guthrie, Charles, <i>Moscow Mansions, 224, Cromwell-road, South Kensington, S.W.</i>
1880		*Gwynne, James E. A., J.P., F.S.A., <i>Folkington Manor, Polegate, Sussex.</i>
1887		Gwyther, John H., 13, <i>Lancaster-gate, W.</i>
1892	<i>d</i>	Hadfield, Sir Robert A., F.R.S., <i>Parkhead House, Sheffield.</i>
1873	<i>d</i>	*Haggard, Frederick T., 1, <i>Broadwater Down, Tunbridge Wells.</i>
1903		*Haig, Edric W., M.A., LL.M., <i>Gatehampton, Goring, Oxon.</i>
1887		Haldeman, Donald C., <i>The Rookery, Downe, Kent.</i>
1912		Hall, Professor Frederick, B.A., "Grasmere," <i>Lansdowne-road, Belfast.</i>
1897	<i>d</i>	Hall, Thomas, <i>Railway Commissioners' Offices, Sydney, N.S.W.</i>
1878		Hallett, Thomas G. P., M.A., <i>Claverton Lodge, Bath.</i>
1911		Hamer, William Heaton, M.D., F.R.C.P., 55, <i>Dartmouth Park-hill, N.W.</i>
1873	<i>c d p</i>	HAMILTON, THE RT. HON. LD. GEORGE F., G.C.S.I. (Hon. Vice-President), 17, <i>Montagu-street, Portman-sq., W.</i>
1884		*Hammersley, Hugh G., <i>The Grove, Hampstead, N.W.</i>

Year of Election.		
1910	<i>d</i>	Hammond, H. Pierson, <i>Connecticut Insurance Dept., Hartford, Conn., U.S.A.</i>
1875		Hankey, Ernest A., <i>Notton, Lacock, Chippenham.</i>
1906		Hannon, Patrick J. H., <i>The Navy League, 11, Victoria-street, S.W.</i>
1886		*Hardcastle, Basil W., <i>10, Gainsborough-gardens, Hampstead, N.W.</i>
1912		Harper, C. J. S., <i>1, New Court, Carey-street, Lincoln's Inn, W.C.</i>
1901	<i>c d p</i>	Harper, Edgar J., <i>Beech Hurst, Haling Park-road, Croydon.</i>
1906		*Harper, Roberts, F.R.G.S.,
1893		Harrap, Thomas, <i>230, Stamford-street, Ashton-under-Lyne, Lancs.</i>
1897		Harris, Walter F., F.I.C.A., <i>13, Westbourne-avenue, Hull.</i>
1909		Harrison, C. W. Francis, F.R.G.S., <i>c/o The Hon. Joseph Baynes, C.M.G., Nel's Rust, Natal.</i>
1913		Hart, Charles, <i>41, Duke's-avenue, Muswell Hill, N.</i>
1900	<i>p</i>	Hartley, Edwin L., B.A., <i>1, Paper-buildings, Temple, E.C.</i>
1911		Hatch, Sir Ernest F. G., Bart., <i>20, Portland-place. W.</i>
1910		Haw, George, <i>91, Hampstead Way, N.W.</i>
1896		Hawkins, Willoughby R., <i>Bute Docks, Cardiff.</i>
1912		Hawtrej, R. G., <i>104, Beaufort-mansions, Chelsea, S.W.</i>
1897		Hayakawa, S., <i>69, Nagatacho-Nichome, Tokio, Japan.</i>
1895	<i>d</i>	Haynes, Thomas H., <i>17, Denmark-avenue, Wimbledon.</i>
1909		Heath, John St. George C., <i>170, Palace-chambers, Bridge-street, Westminster.</i>
1911		*Heaton, The Rev. Harold Hjalmar, M.A., <i>111, Balfour-road, Ilford.</i>
1896		*Heaton-Armstrong, William C., J.P., <i>5, Cornwall-gardens, S.W.</i>
1912		Heimbrod, G., <i>Lantoka, Fiji.</i>
1908		Heinicke, Fedor, <i>c/o The Forestal, Ltd. (Box Office) Cassila Correo, 1167, Buenos Ayres, Argentina.</i>
1889		*Hemming, Arthur G., F.I.A., <i>London Assurance Corporation, 7, Royal Exchange, E.C.</i>
1906	<i>d</i>	Heron, David, M.A., D.Sc., <i>Galton Eugenics Laboratory, University College, Gower-street, W.C.</i>

Year of Election.		
1911		Hicks, John Cranfield, <i>Elmwood, Buckhurst-hill, Esser.</i>
1892	<i>c d p</i>	*Higgs, Henry, LL.B., C.B., <i>Ministry of Finance, Cairo, Egypt.</i>
1911		Higham, John Sharp, M.P., <i>25, Mosley-street, Manchester.</i>
1912		Higman, J. C., <i>Thornycroft, Bridgend.</i>
1900		Hillingdon, The Right Hon. Lord, <i>67, Lombard-street, E.C.</i>
1910	<i>d</i>	Hinckes, Ralph T., <i>3, Wilton-terrace, Belgrave-square, S. W.</i>
1906		Hind, Robert, J.P., <i>Editor, "The Journal," Grahamstown, S. Africa.</i>
1910		Hirst, Francis Wrigley, <i>3, Arundel-street, Strand, W.C.</i>
1903		Hiscock, Elias J., <i>51, Sotheby-road, Highbury, N.</i>
1909		*Hobson, Charles Kenneth, <i>The Gables, Mount Pleasant, Cambridge.</i>
1904		Hobson, John A., <i>3, Gayton-crescent, Hampstead, N. W.</i>
1908	<i>d</i>	Hoffman, Frederick L., <i>Prudential Insurance Co., Newark, N.J., U.S.A.</i>
1912	<i>d</i>	Hofmeyr, P. J. H., <i>Department of Interior, Pretoria.</i>
1895		Holland, Hon. Lionel R., <i>75, Eaton-square, S. W.</i>
1898		Holland, Robert M., C.B., <i>68, Lombard-street, E.C.</i>
1901		Holmes, Richard H., J.P. (Alderman). <i>10, Royal Arcade, Newcastle-on-Tyne.</i>
1895	<i>d p</i>	*Hooker, R. H., M.A., <i>3, Holywell-hill, St. Albans.</i>
1906	<i>d</i>	Hooper, Frederick, <i>Board of Trade, 73, Basinghall-street, E.C.</i>
1879		Hooper, George N., <i>Elmligh, Hayne-road, Beckenham, Kent.</i>
1903	<i>d</i>	Hooper, William G., F.R.A.S., <i>40, Portland-road, Edgbaston, Birmingham.</i>
1878	<i>c d p</i>	Hooper, Wynnard, <i>13, Sumner-place, Onslow-square, S. W.</i>
1910		Hope, E. W., M.D., L.R.C.P., <i>Public Health Dept., Municipal Offices, Liverpool.</i>
1887		Hopkins, John, <i>Little Boundes, Southborough, Kent.</i>
1899	<i>d</i>	Hopkins, J. Castell, c/o <i>The Annual Review Publishing Co., 2, College-street, Toronto.</i>
1912		Hopkins, William, <i>112, Wallwood-road, Leytonstone, N.E.</i>

Year of Election.		
1909	d	Hore, C. F. Adair, <i>Local Government Board, S.W.</i>
1913		Horwitz, Israel, <i>139, Whitechapel-road, E.</i>
1910	d	*Howard, Henry Fraser, C.I.E., <i>Meldreth, Woking.</i>
1883		Howell, Francis B., <i>Ethy, Lostwithiel, Cornwall.</i>
1897	p	Howell, Price, <i>Killara, near Sydney, N.S.W.</i>
1913		Hughes, T. Herbert, <i>The "White House," Barnard-road, Leigh Park, Leigh-on-Sea.</i>
1874	c d p	HUMPHREYS, NOEL A., I.S.O., <i>"Woodstock," St. George's-road, Worthing.</i>
1903		Hunt, Arthur L., <i>"Bryn," Somerville-road, Sutton Coldfield.</i>
1888		Hunter, Alderman G. B., D.Sc., <i>Wallsend-on-Tyne.</i>
1910		Hurst, Thomas J. P., <i>Hayton, Westbury-road, Woodside Park, N.</i>
1902	d p	Hutchins, Miss B. L., <i>The Glade, Branch-hill, Hampstead-heath, N.W.</i>
1912	p	Hutchinson, Professor Lincoln, <i>University of California, Berkeley, California, U.S.A.</i>
1888		Hyde, Sir Clarendon G., <i>Longworth House, Berks.</i>
1901		Hyde, Hugh V., <i>Board of Agriculture and Fisheries, 3, St. James's-square, S.W.</i>
1893	d	Hyde, Hon. John, F.R.G.S., F.S.A. Scot., <i>Lanier Heights, Washington, D.C., U.S.A.</i>
1903	d p	Hythe, The Rt. Hon. Viscount, <i>Park Gate, Battle.</i>
1874	d p	*Ingall, William T. F. M., <i>Invermark, Limpsfield, Surrey.</i>
1887		Irvine, S. W. D'Arcy, J.P., <i>Equitable Life Assurance Soc. of U.S.A., c/o Morning Post Building, 346, Strand, W.C.</i>

Year of Election		
1910		Jack, Henry J., "Heathfield," 357, Clapham-road, S.W.
1912		Jacob, S. M., Delhi Club, Delhi, India.
1902		Jagger, John W., Cape Town.
1906		James, A. F. Brodie, Gresham House, Old Broad-street, E.C.
1894	d	Jamieson, George, C.M.G., 180, St. James's-court, Euckingham Gate, S.W.
1908		Janisch, Noel, C.M.G., Colonial Secretary's Office, Cape Town, S. Africa.
1897	c d	JAY, E. A. HASTINGS, M.A., LL.B., Tower House, Woolwich.
1881		*Jersey, The Right Hon. the Earl of, G.C.B., Osterley-park, Isleworth.
1907	d p	*Jevons, H. Stanley, M.A., B.Sc., 3, Pembroke Terrace, Cardiff.
1881		Johnson, E. Eltham, 110, Cannon-street, E.C.
1910		Johnson, E. Stewart. The Hospital for Sick Children, Great Ormond-street, W.C.
1911		Joicey, The Rt. Hon. Lord, Ford Castle, Cornhill-on-Tweed.
1911		*Jones, David C., The University, Durham.
1905		Jones, John H., Political Economy Department, University, Glasgow.
1877		Jones, Theodore B., 70, Gracechurch-street, E.C.
1888	d	*Jordan, William L., Royal Societies Club, St. James's-street, S.W.
1889		Justican, Edwin, F.I.A., Royal Societies Club, St. James's-street, S.W.
1910		*Kahn, Stephane, F.R.G.S., 4, Sloane Court, S.W.
1902		Kains-Jackson, Charles P. C., 10, The Green, Richmond.

Year of Election		
1885		Keen, William B., 23, <i>Queen Victoria-street, E.C.</i>
1884		Kelly, Edward F., 182—184, <i>High Holborn, W.C.</i>
1883	c d	Keltie, John Scott, F.R.G.S., LL.D., 10, <i>Albemarle Mansions, Heath-drive, Finchley-road, N.W.</i>
1878		Kennedy, J. Murray, <i>New University Club, St. James's-street, S.W.</i>
1898		Kent, Arthur C., 176, <i>Victoria-street, S.W.</i>
1899		Kershaw, John B. C., F.I.C., <i>West Lancs. Laboratory, Waterloo, Liverpool.</i>
1905		Keshishian, Agazar, 99, <i>John-street, New York, U.S.A.</i>
1909		Kettle, Bernard, <i>Guildhall, E.C. (Representing the Library Committee of the Corporation of the City of London).</i>
1909	d	Keynes, John M., M.A., <i>King's College, Cambridge.</i>
1883	d	*Keynes, John N., M.A., D.Sc., 6, <i>Harvey-road, Cambridge.</i>
1906		Khras, Minocher J. S., <i>Khras Bungalow, Middle Colaba, Bombay.</i>
1884		Kimber, Sir Henry, Bart., M.P., 79, <i>Lombard-street, E.C.</i>
1898	c d	*KING, A. W. WATERLOW, J.P., <i>Orchard House, Gt. Smith-st., Westminster, S.W.</i>
1883	p	*King, Bolton, M.A., <i>Arden Lodge, Warwick.</i>
1911		Kinnear, Walter S., B.A., <i>Royal Exchange Assur., 5, College Green, Dublin.</i>
1894		*Kirkcaldy, William M., <i>Dunedin, Otago, New Zealand.</i>
1913		Kitchin, Joseph, <i>"Inglenenk," Bruckley-road, Beckenham, Kent.</i>
1889		Kloetgen, W. J. H., 20—21, <i>Lawrence-lane, E.C.</i>
1906	d	Knibbs, George H., C.M.G., <i>Commonwealth Statistician, Melbourne, Victoria.</i>
1878	d	*Kusaka, Yoshio, <i>First National Bank, Tokio, Japan.</i>

Year of Election.		
1901	<i>d</i>	Lakin-Smith, Herbert, F.C.A., 26, <i>Waterloo-street, Birmingham.</i>
1902	<i>p</i>	Lark, Albert E., F.C.A., <i>Hall Quay Chambers, 2, South Quay, Great Yarmouth.</i>
1885	<i>d</i>	Latham, Baldwin, M.Inst.C.E., <i>Parliament-mansions, Victoria-street, S.W.</i>
1910	<i>d</i>	Laughton, A. M., <i>Government Statist, Melbourne, Victoria.</i>
1912		Lavington, Frederick, 31, <i>Well-walk, Hampstead, N.W.</i>
1897	<i>d</i>	*Lawrence, Frederick W., M.A., 87, <i>Clement's-inn, W.C.</i>
1890	<i>d</i>	Lawson, William R., <i>Finchley Lodge, North Finchley, N.</i>
1908		Layton, Walter T., <i>Cains College, Cambridge.</i>
1883	<i>d</i>	*Leadam, Isaac S., M.A., 21, <i>Cadogan-gardens, S.W.</i>
1905	<i>d</i>	*Leake, Percy D., 25, <i>Abchurch-lane, E.C.</i>
1911		Leask, Peter, M.A., "Dracmont," <i>Albert-road, Wimbledon, S.W.</i>
1910		Lee-Nash, Walter, <i>The Office of Woods, 1, Whitehall, S.W.</i>
1887		*Leitch, Alexander (<i>Scottish Provident Institution</i>), 3, <i>Lombard-street, E.C.</i>
1907		Lempfert, R. G. K., M.A., 66, <i>Sydney-street, Chelsea, S.W.</i>
1892		Leon, Sir Herbert S., Bart., <i>Bletchley-park, Bletchley, Bucks.</i>
1888		*Le Poer-Trench, Col. The Hon. W., R.E., J.P., <i>St. Hubert's, Gerrard's-cross, R.S.O., Bucks.</i>
1887		*Le Roy-Lewis, Lieut.-Colonel Herman, C.B., D.S.O., <i>Westbury House, Petersfield, Hants.</i>
1910		*Leslie, Robert, <i>Almond Cottage, Newbridge, Ratho Station.</i>
1899		L'Estrange, Charles J.,
1908		*Lever, Sir William H., Bart., <i>The Hill, Hampstead Heath, N.W.</i>
1903	<i>d</i>	Levy, Professor Hermann, <i>Kussmaulstr. 10, Heidelberg, Germany.</i>
1912		Levy, Raphael G., 3, <i>Rue de Noisiel, Paris.</i>
1908		Lewis, Hugh (<i>L'pool, London & Globe Insurance Co.</i>), 1, <i>Cornhill, E.C.</i>
1862	<i>d</i>	Lewis, Robert, 1, <i>Bartholomew-lane, E.C.</i>
1888		*Liberty, Sir Arthur L., <i>The Manor House, The Lee, near Gt. Missenden.</i>

Year of Election.		
1911		Likeman, William C., <i>Blue Coat School, Reading.</i>
1902	<i>d</i>	Litchfield, Frederick, 96, <i>Hampstead Way, Hendon, N.W.</i>
1898		Litkie, Valerian A., 39, <i>South-street, W.</i>
1892		Llewelyn, Sir John T. D., Bart., <i>Penllergaer, Swansea.</i>
1903		*Lloyd, Godfrey I. H., <i>The University of Toronto, Canada.</i>
1913		Loban, Gustavus Taylor, <i>Devonshire Club, St. James's-street, S.W.</i>
1888	<i>c d p</i>	LOCH, PROFESSOR CHARLES S., D.C.L., <i>Drylaw Cottage, Little Bookham, Surrey.</i>
1882	<i>c d p</i>	*Longstaff, George B., M.A., M.D., F.R.C.P., <i>Highlands, Putney Heath, S.W.</i>
1907	<i>d</i>	Lord, Samuel, A.S.A.A., 18, <i>Lynton-road, Acton, W.</i>
1876		*Lornie, John G., J.P. (of Birnam & Pitcastle), <i>Rosemount, Kirkcaldy, N.B.</i>
1886		*Low, Malcolm, 22, <i>Roland-gardens, S.W.</i>
1909		*Lubbock, The Hon. Harold Fox Pitt, <i>High Elms, Orpington, Kent.</i>
1912		Lucas, The Right Hon. Lord, 32, <i>Old Queen-street, S.W.</i>
1908		Lupton, William, <i>Ruskin Press, Stafford-street, Birmingham.</i>
1904	<i>d</i>	Luterveld, Willem M. J. van, <i>Schiedamsche Singel, Rotterdam, Holland.</i>
1875		*Mabson, Richard R., "Statist" Office, 51, <i>Cannon-street, E.C.</i>
1894		Macaulay, Thomas B., <i>Sun Life Assurance Co., Montreal, Canada.</i>
1888		McCankie, James, 51, <i>Frederick-street, Edinburgh.</i>
1903		MacConochie, William P., <i>Woodbank, Woodville-road, New Barnet.</i>
1902		Macdonald, John H., 47, <i>Parliament-street, Westminster, S.W.</i>
1898		*Macdonald, Robert A., <i>Royal Bank of Scotland, Edinburgh.</i>

Year of Election.		
1912	p	Macdonald, R. A., M.A., 22, <i>Princes-avenue, Great Crosby, Liverpool.</i>
1872	c d p	Macdonell, Sir John, C.B., LL.D., <i>Room 183, Royal Courts of Justice, W.C.</i>
1873		*McEwen, Laurence T.,
1912		Macfarlane, H., <i>Baysgarth, Eastbury-road, Northwood.</i>
1886		*Mackenzie, Colin, F.R.G.S.,
1876		*McLean, Robert A., F.R.G.S., 1, <i>Queen Victoria-street, E.C.</i>
1913		Macready, W. R., 11, <i>Lombard-street, E.C.</i>
1904		Macrosty, Henry W., B.A., 29, <i>Hervey-road, Blackheath, S.E.</i>
1899		*MacWharrie, Niel M.,
1906	d	Magnus, Sir Philip, M.P., 16, <i>Gloucester-terrace, Hyde Park, W.</i>
1891		Maidment, Thomas, <i>Insurance Chambers, King's-road, Southsea.</i>
1910	d	Malachowski, N. J., <i>Witebskaia Ulica, 15, St. Petersburg, Russia.</i>
1904	c d p	MALLEY, BERNARD, C.B., <i>General Register Office, Somerset House, W.C.</i>
1902	d	Mandello, Professor Julius G., Ph.D., 1, <i>Tabor-utca, 2, Budapest, Hungary.</i>
1908		Manohar Lal, Professor, M.A., <i>Barister-at-Law, Lahore, India.</i>
1884		*Manson, Frederick W., <i>Faircrouch, Wadhurst, Sussex.</i>
1888		Manuel, James, 36, <i>Vittoria-street, Ottawa, Canada.</i>
1880	c d p	*Marshall, Professor Alfred, M.A., <i>Balliol Croft, Madingley-road, Cambridge.</i>
1872	c d p	*MARTIN, SIR RICHARD BIDDULPH, BART. (Hon. Vice-President and Treasurer), 10, <i>Hill-street, Mayfair, W.</i>
1911		Martin, The Hon. Joseph, M.P., <i>Room 202, Carlton House, Westminster, S.W.</i>
1911		Mason, James Francis, M.P., <i>Eynsham Hall, Witney, Oxon.</i>
1884		Mason, William A., 31a, <i>Colmore-row, Birmingham.</i>
1898		Massingberd, Captain Stephen, <i>Gunby Hall, Burgh, Lincolnshire.</i>
1875		*Mathers, John S.,
1911		Maxwell, Arthur, c/o Messrs. Glyn, Mills, Currie and Co., 67, <i>Lombard-street, E.C.</i>

Year of Election.		
1910	d	Maynard, G. D., <i>P.O. Box 1198, Johannesburg.</i>
1910		Maynard, H. R., <i>Kingswood, Antrim-st., Haverstock-hill, N.W.</i>
1901	d	Meakin, George H., A.S.A.A., <i>Town Hall, Islington, N.</i>
1882		Medhurst, John T., F.S.A.A., <i>City of London College, Moorfields, E.C.</i>
1901		Meredith, Hugh O., <i>Hollycroft, Cavendish-avenue, Cambridge.</i>
1884	d	Merton, Zachary, <i>31, Green-street, Park-lane, W.</i>
1912	d	Messenger, H. J., <i>Travellers Insurance Co., Hartford,</i> <i>Connecticut, U.S.A.</i>
1907		Middleton, Professor Thomas H., C.B., M.A., <i>8, Whitehall-place, S.W.</i>
1909		Millard, Percy W., LL.B., <i>3, St. James's-square, S.W.</i>
1900		Miller, John W., <i>Union Club, S.W.</i>
1889		*Mills, Major Henry Farnsby,
1892	c d	Milner, The Rt. Hon. Viscount, G.C.B., G.C.M.G., <i>47, Duke-street, S.W.</i>
1882	p	Milnes, Alfred, M.A., <i>44, Goldhurst-terrace, S. Hampstead, N.W.</i>
1907		*Mitchell, Frederick W., F.R.G.S. <i>Star Assurance Soc., 32, Moorgate-st., E.C.</i>
1902	d	Molesworth, Sir Guilford L., K.C.I.E., <i>The Manor House, Bealey, Kent.</i>
1911		Monckton, H. Percy, <i>32, Walbrook, E.C.</i>
1911		Mond, The Right Hon. Sir Alfred M., Bart., M.P., <i>35, Lowndes-square, S.W.</i>
1911		Monkswell, The Right Hon. Lord, <i>Harold's Haven, Taplow, Bucks.</i>
1899		*Moon, Edward R. P., <i>6, Onslow Gardens, S.W.</i>
1887		Moore, Arthur C., <i>23, Essex-street, Strand, W.C.</i>
1874		Moore, Charles R., <i>43, Breakspears-road, St. Johns, S.E.</i>
1878		*Moore, John B. G., <i>Loydmount, Cookstown, Ireland.</i>
1903		Moores, George, <i>14, Cross-street, Manchester.</i>
1909	d	Morgan, Ben. H., <i>15, Dartmouth-street, Westminster, S.W.</i>
1910		Morgan, H. Allan, <i>Holmwood, Knutsford, Cheshire.</i>

Year of Election.		
1893	<i>d</i>	Morgan, Percy C., <i>Queen Anne's Chambers, S.W.</i>
1902	<i>c</i>	MORISON, SIR THEODORE, K.C.I.E., M.A., <i>Old Avenue Lodge, Weybridge.</i>
1911		Morrison, G. B., <i>28, Victoria-road, Shoreham, Sussex.</i>
1891	<i>c d p</i>	Morrison, Rev. William D., M.A.D., <i>The Rectory,</i> <i>Marylebone Church, Marylebone-road, N.W.</i>
1911		Mortara, Professor Giorgio, <i>Piazza Cavour 19, Rome, Italy.</i>
1885		*Mosley, Tomman, C.B., <i>Bangors, Iwer, Uxbridge.</i>
1886	<i>c</i>	Mowbray, Sir Robert G. C., Bart., <i>90, Piccadilly, W.</i>
1886	<i>d</i>	Moxon, Thomas B., <i>Lanes. and Yorks. Bank, King-st., Manchester.</i>
1904		Mudie-Smith, Richard. <i>Goathland, Rotherwick-road,</i> <i>Hampstead Garden Suburb, N.W.</i>
1883		Muirhead, Henry J., <i>Fairfield, Hythe, Kent: and Reform Club, S.W.</i>
1899	<i>d</i>	Muirhead, James M. P., J.P., F.R.S.E., F.R.S.L., F.S.A.A., F.C.I.S., F.R.C.I., <i>The Royal Automobile Club, Pall Mall, S.W.</i>
1910		Mukherji, Pramatha Nath, M.A., <i>9, St. James's-square, Calcutta, India.</i>
1905		Muller, Oswald V., M.A., <i>Elphinstone College,</i> <i>Bombay; and Newquay, Cornwall.</i>
1891	<i>c d</i>	Murphy, Sir Shirley F., F.R.C.S., <i>9, Bentinck-terrace, Regent's-park, N.W.</i>
1909		Nathan, Eric Burnett, A.I.A., <i>99, Portsdown-road, W.</i>
1878		*Nathan, Henry,
1908		Neill, Samuel B., <i>13a, Canton-road, Shanghai, China.</i>
1908		Neill, Thomas. <i>Oakwood, Southend-road, Beckenham, Kent.</i>
1869	<i>c d p</i>	Neison, Francis G. P., F.I.A., <i>The Hollies, Ringley-park, Reigate.</i>
1877		Nevill, C. Henry, <i>1 and 2, Great Winchester-street, E.C.</i>
1905		Nevill, Henry R., <i>Allahabad, U.P., India.</i>

Year of Election.		
1912		Nevill, Louis B., <i>The Close, Norwich.</i>
1900		Newcomb, Harry T., LL.M., <i>Bethesda, Montgomery County, Md., U.S.A.</i>
1889	<i>c d p</i>	NEWSHOLME, ARTHUR, C.B., M.D., <i>112, Ashley Gardens, S.W.</i>
1895		*Nicholson, Sir Charles N., Bart., M.P., <i>35, Harrington-gardens, South Kensington, S.W.</i>
1878	<i>d p</i>	Nicholson, Professor J. Shield, M.A., D.Sc., F.B.A., <i>University of Edinburgh.</i>
1913		*Nixon, James William, B.Sc., <i>Ecclesiastical Commission, Millbank, S.W.</i>
1871		*Noble, Benjamin, F.R.A.S., <i>Westmorland House, Low Fell, Gateshead.</i>
1912		Norman, Frank A., <i>8, Park-road, Wimbledon, S.W.</i>
1901		Offen, Charles R. W., <i>Bloomsbury House, Cartwright-gardens, W.C.</i>
1912		O'Hara, F. C. T., <i>Department of Trade and Commerce,</i> <i>Ottawa, Canada.</i>
1911		*Oke, Alfred William, B.A., LL.M., F.S.A., <i>33, The Avenue, Southampton.</i>
1885	<i>d</i>	*Oldham, John (<i>River Plate Telegraph Co.</i>), <i>287, San Martin, Buenos Ayres.</i>
1909		O'Malley, L. S. S., I.C.S., <i>Longridge, Pyrford, Surrey.</i>
1899		Ormsby, John Y., <i>c/o Burnett, Ormsby Clapp & Co.,</i> <i>7, Melinda-street, Toronto.</i>
1910		Osborne, Ralph Stanley, <i>6, Powis-square, Bayswater, W.</i>
1887	<i>d</i>	*Page, Edward D., <i>Oakland, Bergen County, N.J., U.S.A.</i>
1899	<i>c d p</i>	PAISII, SIR GEORGE, <i>"Statist" Office, 51, Cannon-street, E.C.</i>

Year of Election		
1866	<i>c d p</i>	*Palgrave, Sir R. H. Inglis, F.R.S., <i>Henstead Hall, Wrentham, Suffolk.</i>
1912		Palmer, Truman G., 902, <i>Union Trust-buildings,</i> <i>Washington, D.C., U.S.A.</i>
1906		Parish, Walter Woodbine, <i>9, Courtfield-road, S.W.</i>
1908		Parker, Charles Sandbach, <i>Demerara-buildings, St. Dunstan's-hill, E.C.</i>
1903		Parker, Sir Gilbert, M.P., <i>20, Carlton House-terrace, S.W.</i>
1891		Parker-Smith, The Rt. Hon. James, <i>20, Draycott-place, S.W.</i>
1883		Paterson, John, <i>1, Walbrook, E.C.</i>
1912		Patrick, James, <i>Town Hall, Sunderland.</i>
1888		Pattullo, James Durie, <i>65, London Wall, E.C.</i>
1878	<i>d</i>	Paulin, Sir David, <i>6, Forres-street, Edinburgh.</i>
1893	<i>d</i>	Payne, Alexander W., F.C.A., <i>70, Finsbury-pavement, E.C.</i>
1884		*Peace, Sir Walter, K.C.M.G., I.S.O., <i>83, Victoria-street, Westminster, S.W.</i>
1910		Peacock, Walter, M.V.O., <i>3, Buckingham-gate, S.W.</i>
1910		Peake, Edward Gordon, <i>98, James-street, Dublin.</i>
1909		Pearce, A. James, A.C.A., <i>Corn Exchange Chambers, Princes-st., Ipswich.</i>
1895		Peixotto, M. Percy (<i>U.S. Equitable Life Office</i>), <i>23, rue de la Paix, Paris.</i>
1903		Pekelharing, Dr. G., <i>11, Zeemansstraat, Rotterdam.</i>
1891	<i>d</i>	Penn-Lewis, William, <i>"Cartref," Toller-road, Leicester.</i>
1892		*Pentland, The Right Hon. Lord, <i>Government House, Madras.</i>
1911		Pepper, James, <i>Silverdale, Palmerston-road, Derby.</i>
1906		Perkins, Herbert H. W., <i>Bolton-chambers, Eastbourne.</i>
1890		Peters, John W., <i>5, King's-road, Southsea.</i>
1886		Peto, Sir Henry, Bart., M.A., <i>Chedington Court, Misterton, Crewkerne.</i>
1887	<i>d</i>	Phelps, Lieut.-General Arthur, <i>23, Augustus-road, Edgbaston, Birmingham.</i>
1908	<i>d</i>	Phelps, E. Bunnell, M.A., " <i>The American Underwriter</i> ," <i>500, West 122d-street, New York City, U.S.A.</i>

Year of Election.		
1886	d	*Phelps, Rev. Lancelot R., M.A., <i>Oriel College, Oxford.</i>
1912		Phillips, John, F.R.C.I., <i>28, Cambridge-road, Hove, Brighton.</i>
1900	d	*Pigou, Professor Arthur C., M.A., <i>King's College, Cambridge.</i>
1904		Pilling, John A., <i>c/o Messrs. Deloitte and Co.,</i> <i>Florida 77, Buenos Ayres.</i>
1878	d	*Pim, Joseph Todhunter, <i>Rinnamara, Monkstown, Co. Dublin.</i>
1903		Pirrie, The Right Hon. Lord. K.P., LL.D., <i>Downshire House, Belgrave-square, S.W.</i>
1881		Planck, Deputy Surgeon-General Charles, M.R.C.S., <i>Lyden Croft, Edenbridge, Kent.</i>
1902		Plant, Alfred T., <i>Accountant's Office, G.W.R., Paddington, W.</i>
1901		Plender, Sir William (<i>c/o Messrs. Deloitte and Co.</i>), <i>5, London Wall-buildings, Finsbury-circus, E.C.</i>
1896	c d	*Pontifex, Bryan, A.C.A., <i>Imperial Bank-buildings, Toronto, Canada.</i>
1912	p	Popplewell, Frank, B.Sc., <i>Huntsmoor, Northwood, Middlesex.</i>
1891		Potter, Henry, <i>Normanhurst, Grosvenor-rd., West-</i> <i>cliffe-on-Sea, Essex.</i>
1913		Pownall, George Henry, <i>Moorside, Cherry Garden-avenue, Folkestone.</i>
1867		*Pratt, Robert L., <i>13, Danesbury-terrace, Darlington.</i>
1896		Pretymann, Captain Ernest G., M.P., <i>Orwell-park, Ipswich.</i>
1887	c d p	*Price, L. L., M.A., <i>Oriel College, Oxford.</i>
1877	c d p	Price-Williams, Richard, <i>Ormsary, Christchurch-road, Bournemouth.</i>
1909		Pritchard, Arthur, M.A., <i>3, Temple-gardens, Temple, E.C.</i>
1887	c d p	PROBYN, SIR LESLEY, K.C.V.O., <i>79, Onslow-square, S.W.</i>
1889		Probyn, Lieut.-Colonel Clifford, <i>55, Grosvenor-street, Grosvenor-square, W.</i>
1886	d	Provand, Andrew D., <i>2, Whitehall-court, S.W.</i>
1896		Pryor, Edward T., <i>23, Fore-street, E.C.</i>
1911		Pullar, James, F.F.A., A.I.A., <i>Colonial Mutual Life</i> <i>Assurance Society, Ltd., 419, Collins-street,</i> <i>Melbourne, Australia.</i>

Year of Election.		
1901		Quin, Stewart B., F.C.A., 16, <i>Donegall-square South, Belfast.</i>
1883		Rabbidge, Richard, F.C.A., 32, <i>Poultry, E.C.</i>
1872	<i>d p</i>	*Rabino, Joseph, 33, <i>St. George's-road, Eccleston-square, S. W</i>
1858		*Radstock, The Right Hon. Lord, <i>Mayfield, Woolston, Southampton.</i>
1885	<i>c d</i>	Rae, John, M.A., 1, <i>Rockland-road, Putney, S. W.</i>
1887	<i>d p</i>	Raffalovich, His Excellency Arthur, 19, <i>Avenue Hoche, Paris.</i>
1912		Ramsay, John M., 29, <i>St. Andrew-square, Edinburgh.</i>
1880	<i>c</i>	Rankin, Sir James, Bart., M.P., <i>Bryngwyn, Hereford.</i>
1897		Ranson, Albert, <i>Tavern-street, Ipswich.</i>
1903	<i>d</i>	Rathbone, Miss Eleanor F., <i>Green Bank, Liverpool, E.</i>
1877		*Rawlins, Thomas, 45, <i>King William-street, E.C.</i>
1910	<i>d</i>	Rea, Peter Mackenzie, <i>Merton House, Salisbury-sq., Fleet-street, E.C.</i>
1908		Reade, Herbert Vincent, C.B., 32, <i>Palace Gardens-terrace, Kensington, W.</i>
1889		*Reed, Thomas, F.C.A., 63, <i>King-street, South Shields.</i>
1908		Reid, George T., B.Sc., <i>Clunie Cottage, Beaconsfield, Bucks.</i>
1888	<i>c d p</i>	REW, R. HENRY, C.B. (<i>Vice-President</i>) (<i>Hon. and Hon. Foreign Sec.</i>), 14, <i>Embankment-gardens, S. W.</i>
1895		Richards, Roger C., <i>Cader House, Foxley-lane, Purley.</i>
1909		Ridley, Rt. Hon. Viscount, 10, <i>Carlton House-terrace, S. W.</i>

Year of Election		
1913		Riley, Ernest, 40, <i>Northdown-street, Caledonian-road, N.</i>
1894	d p	Robertson, J. Barr, 10, <i>Walbrook, E.C.</i>
1900		Robinson, James, 10, <i>Alma-place, North Shields.</i>
1912		Rockliff, Percy, 108-114, <i>City-road, E.C.</i>
1873	c	*Rosebery, The Rt. Hon. the Earl of, K.G., K.T., F.R.S., 38, <i>Berkeley-square, W.</i>
1904	c d p	ROSENBAUM, SIMON, M.Sc., 94, <i>Barrow Gate-road, Chiswick, W.</i>
1892	d	Ross, C. Edmonstone, F.S.A.A., c/o <i>Messrs. Thos. Cook and Son, Ludgate Circus, E.C.</i>
1904		Routly, William H., F.S.A.A., <i>Borough Treasurer, Folkestone.</i>
1911		Rowallan, The Rt. Hon. Lord, <i>Rowallan, Kilmarnock, and 26, Hans-place, S. W.</i>
1911		Rowland, John, <i>The Treasury, Whitehall, S. W.</i>
1899	d	Rowntree, B. Seebohm, 32, <i>St. Mary's, York & The Homestead, Clifton, York.</i>
1898	d p	Rozenraad, Cornelius, 4, <i>Moreton-gardens, South Kensington, S. W.</i>
1890		Ruffer, Marc A., C.M.G., M.A., M.D., B.Sc., <i>Ramleh, Egypt.</i>
1888	d	Rusher, Edward A., F.I.A., 142, <i>Holborn Bars, E.C.</i>
1886		Russell, Arthur B., F.C.A., <i>Marlborough House, 11, Ludgate-hill, E.C.</i>
1910		Russell, Hon. Francis Albert Rollo, <i>Steep, Petersfield, Hants.</i>
1907	d	Rutter, Frank R., Ph.D., <i>Bureau of Statistics, Dept. of Agriculture, Washington, D.C., U.S.A.</i>
1907		Rye, Reginald A., <i>Goldsmiths' Librarian, University of London, South Kensington, S. W.</i>
1913		Sabel, Paul, <i>Raadlinsstraat, Amsterdam, Holland.</i>
1909	d p	*Sale, Charles V., 21, <i>Old Broad-street, E.C.</i>
1875	d	*Salomons, Sir David L., Bart., J.P., <i>Broom-hill, Tunbridge Wells.</i>

Year of Election		
1908	<i>d</i>	Samuel, George A. H., <i>Abinger Cottage, Aldersmeul-road, New Beckenham, Kent.</i>
1899	<i>d</i>	Sanderson, Frank, M.A., <i>Canada Life Ass. Co., Toronto, Canada.</i>
1895	<i>c</i>	SANGER, CHARLES P., M.A., <i>58, Oakley-street, Chelsea, S.W.</i>
1891		*Sarda, Pandit Har Bilas, B.A., M.R.A.S., <i>Government College, Ajmere, India.</i>
1886	<i>d p</i>	Sanerbeck, Augustus, <i>Champion Hill House, Champion-hill, S.E.</i>
1887		*Scarth, Leveson, M.A., <i>84, Oakwood-court, Kensington, W.</i>
1904		*Schlesinger, Louis G., <i>12A, Avenida Sur 16B, Guatemala.</i>
1908	<i>d</i>	Schmidt, Arno, <i>22, St. Mary's-gate, Manchester.</i>
1895		Schmidt, Hermann, <i>36A, Amphill-square, N.W.</i>
1891	<i>d p</i>	Schooling, J. Holt, <i>Fotheringhay Hse., Montpelier-row, Twickenham.</i>
1908		Schumpeter, Dr. Joseph A., <i>University of Graz, Graz, Austria.</i>
1895	<i>d</i>	Schuurman, Willem H. A. Elink, <i>Godelindeweg, 10, Hilversum, Holland.</i>
1883		*Schwamm, John F., <i>Oakfield, Wimbledon, S.W.</i>
1880		*Seeley, Sir Charles, Bart., <i>Sherwood Lodge, Nottingham.</i>
1905		Sellar, Alexander S., M.A., <i>17, Coleman-street, E.C.</i>
1911		Sen, Nirmalsankar, M.A., <i>Serampore, E.I.R., Bengal.</i>
1899		Setchfield, George B., <i>Beulah Kop, 3, Clarkson-street, Sheffield.</i>
1886	<i>d p</i>	Seyd, Ernest J. F., <i>Cider Mill Hatch, Newdigate, Surrey.</i>
1905	<i>d</i>	Seyd, Richard E. N. J., <i>38, Lombard-street, E.C.</i>
1909		Sharp, Clifford Dyce, <i>Woodside Corner, Erskine-hill, Hendon, N.W.</i>
1898	<i>c d p</i>	Shaw, William N., D.Sc., F.R.S., <i>10, Moreton-gardens, South Kensington, S.W.</i>
1907		Sheffield, The Right Hon. Lord, <i>18, Mansfield-street, W.</i>
1912	<i>d</i>	Sheppard, W. F., Sc.D., <i>Braybrooke, Worcester-road, Sutton, Surrey.</i>
1898	<i>d</i>	Sherwell, Arthur, <i>102-3, Bedford Court-mansions, W.C.</i>
1888		Shillecock, Joshua, M.A., <i>Bank of England, Burlington-gardens, W.</i>

Year of Election.		
1907		Shimmell, James E., A.I.A., <i>c/o British Legal Life Assurance Co., Ltd., 78, New Oxford-st., W.</i>
1911		*Shirras, G. Findlay, M.A., <i>United Service Club, Chowringhee, Calcutta, India.</i>
1913		Shove, Gerald Frank, B.A., 38, <i>Brunswick-square, W.C.</i>
1907	d	Simon, André L., 24, <i>Mark-lane, E.C.</i>
1902		Sinclair, H. D., 19 and 20, <i>Silver-street, Wood-street, E.C.</i>
1910		Slough, William Henry, 28, <i>Cluwerley-grove, Church End, Finchley, N.</i>
1906		Smith, Charles, 11, <i>Winter-street, Sheffield.</i>
1878	d	*Smith, George, LL.D., C.I.E., 10, <i>South Learnmouth-gardens, Edinburgh.</i>
1889	d	Smith, G. Armitage, M.A., D.Sc., 3, <i>Albert-terrace, Regent's-park, N.W.</i>
1904		*Smith, H. B. Lees, M.A., M.P., <i>Latimer House, Church-street, Chiswick, W.</i>
1906		Smith, Horace A., <i>Bureau of Statistics, Sydney, N.S.W.</i>
1888	c d	Smith, Sir H. Llewellyn, K.C.B., B.Sc., <i>Oakfield Lodge, Ashtead.</i>
1901		Smith, Robert J., C.A., 163, <i>West George-street, Glasgow.</i>
1905		Smith, Stanley George, A.C.A., 19, <i>Grosvenor-road, Muswell-hill, N.</i>
1894		*Smith, The Hon. William F. D., M.P., 3, <i>Grosvenor-place, S.W.</i>
1908		Smith, William H., F.S.A.A., "Belmont," <i>Ferriby-road, Hessle, E. Yorks.</i>
1894		Smithers, Frederick O., 171, <i>Adelaide-road, South Hampstead, N.W.</i>
1910	d p	Snow, Ernest Charles, M.A., D.Sc., <i>Sir John Cass's Institute, Jewry-street, E.C.</i>
1900	c p	*Somerville, Professor William, M.A., D.Sc., 121, <i>Banbury-road, Oxford.</i>
1899		Sorley, James, F.I.A., F.F.A., F.R.S.E., 82, <i>Onslow-gardens, S.W.</i>
1904		Souter, John, <i>Box 301, Bloemfontein.</i>
1881		Southwark, The Rt. Hon. Lord, M.P., 12, <i>Devonshire-place, Portland-place, W.</i>
1895		Soward, Alfred W., C.B., 28, <i>Therapia-road, Honor Oak, S.E.</i>
1855	d	Sowray, J. Russell, "Fairlawn," <i>Teston, Maidstone.</i>
1904		Sowrey, John W., "Beaconsfield," <i>Devonshire-road, Merton, S.W.</i>

Year of Election.		
1911		Spain, Frederick G. L., <i>Bassishaw House, 70a, Basinghall-street, E.C.</i>
1896		Sparrow, Frederick S., <i>84, Pitt-street, Sydney, N.S.W.</i>
1906		Spear, Bertram E., <i>2, Savoy-hill, Victoria Embankment, W.C.</i>
1904		Spencer, Frederick H., LL.B., <i>6, Curzon-road, Prenton, Birkenhead.</i>
1867		*Spencer, Robert J.,
1892		Spender, John A., M.A., <i>45, Sloane-street, S.W.</i>
1897	d	Spensley, J. Calvert, <i>The Chalcots, England's-lane, Hampstead, N.W.</i>
1911		Speyer, The Rt. Hon. Sir Edgar, Bart., <i>46, Grosvenor-street, W.</i>
1883		Spicer, The Rt. Hon. Sir Albert, Bart., M.P., <i>50, Upper Thames-street, E.C.</i>
1856	d	*Sprague, Thomas B., M.A., LL.D., F.I.A., <i>29, Buckingham-terrace, Edinburgh.</i>
1882		Stack, Thomas N., <i>7, Union-court, E.C.</i>
1901		Stallard, Charles F., <i>P.O. Box 5156, Johannesburg.</i>
1911		Stamp, Jos. C., B.Sc., 4, <i>Waldegrave-gardens, Strawberry Hill, Middlesex.</i>
1902		*Steel-Maitland, Arthur H. D. R., M.P., <i>72, Cadogan-square, S.W.</i>
1899		Stenberg, Ernst G., <i>Chief Electoral Officer, W. Australia, Perth, W.A.</i>
1882		*Stern, Sir Edward D., <i>4, Carlton House-terrace, S.W.</i>
1885	d	*Stevens, Marshall, <i>Trafford Park, Manchester.</i>
1903	d	Stevens, William J., <i>"St. Clair," Tyson-road, Forest Hill, S.E.</i>
1908	c d p	*STEVENSON, DR. T. H. C., <i>General Register Office, Somerset House, W.C.</i>
1911		Stiles, Clement R., <i>"Gonville," Clarendon-road, Wallington, Surrey.</i>
1906		*Stock, Edward J., A.I.A., <i>395, Collins-st., Melbourne, Victoria, Australia.</i>
1889		Stow, Major Harry V., <i>1, Oxford-court, Cannon-street, E.C.</i>
1883	d	*Strathcona, The Right Hon. Lord, G.C.M.G., <i>28, Grosvenor-square, W.</i>
1912		Strauss, Regierungsrat Johann, <i>Director of the Statistical Dept., Sarajevo, Bosnia</i>
1884		*Sugden, Richard, <i>The Farre Close, Brighouse, Yorkshire.</i>

Year of
Election.
1900

Swetenham, Charles C.,
c/o Grindlay Groom & Co., Bombay, India.

1889	<i>d</i>	Tattersall, William, <i>Melbrook, Bowdon, Cheshire.</i>
1905		Taylor, William B., B.A., LL.B., <i>112-118, King-street West, Toronto.</i>
1893		Teece, Richard, F.I.A., F.F.A., <i>Actuary, A.M.P. Society, Sydney, N.S.W.</i>
1888	<i>d</i>	Temperley, William A., junr., <i>2, St. Nicholas-buildings, Newcastle-on-Tyne.</i>
1888		Theobald, John W., <i>8, Fairfield-road, Croydon.</i>
1888	<i>c d p</i>	THOMAS, DAVID A., M.A., <i>Llanwrn, near Newport, Mon.</i>
1905		Thomas, P. Scofield, <i>220, Croydon-road, Anerley, S.E.</i>
1864		*Thompson, Henry Y., <i>19, Portman-square, W.</i>
1909		Thompson, John W., F.F.A., A.I.A., <i>Harwarden, Cockenzie, N.B.</i>
1901	<i>d p</i>	Thompson, Robert J., <i>Board of Agriculture, &c.,</i> <i>8, Whitehall-place, S.W.</i>
1912	<i>c d p</i>	*THOMPSON, SIR WILLIAM JOHN, M.D., <i>59, Fitzwilliam-square, Dublin, Ireland.</i>
1889	<i>d</i>	Touche, George A., M.P., <i>Broomfield, Westcott, near Dorking.</i>
1911		Towler, William George, <i>33, Tothill-street, Westminster, S.W.</i>
1913		Trachtenberg, H. L., B.A., A.I.A., <i>139, Fordwych-road, Cricklewood, N.W.</i>
1911		Trachtenberg, Mendel Isidore, B.A., <i>139, Fordwych-road, Cricklewood, N.W.</i>
1868		*Treatt, Frank B., <i>Court House, Courra, New South Wales.</i>
1868		Tritton, Joseph H., <i>54, Lombard-street, E.C.</i>
1903	<i>d</i>	Trivett, John B., <i>Bureau of Statistics, Sydney, N.S.W.</i>
1885		Turner, William, <i>c/o The Librarian,</i> <i>Free Public Library, Trinity-street, Cardiff.</i>
1909		Turnor, Christopher, <i>Panton Hall, Wragby, Lincolnshire.</i>

Year of Election.		
1892	d	Tyler, Edgar A., F.S.A.A., F.C.I.S., 9, <i>Old Jewry Chambers, E.C.</i>
1903		Unstead, John F., M.A., D.Sc., F.R.G.S., <i>The Bend, Florence-road, Sanderstead.</i>
1903		*Vaizey, Ker G. R., <i>Lloyd's, London, E.C.</i>
1888		Van Raalte, Marcus, 22, <i>Austin Friars, E.C.</i>
1912		Varney, G. T., <i>Elm Lodge, 67, Hillfield-road, West Hampstead.</i>
1889		*Venning, Charles H., <i>Local Govt. Mutual Guarantee Soc., Ltd., 10 & 12, Ludgate-hill, E.C.</i>
1909	p	Verney, Harry, B.Sc., B.Comm. LL.B., 13, <i>Knowsley-street, Bury, Lancs.; Home Office, S.W.</i>
1886	c	Verulam, The Right Hon. the Earl of, <i>Gorhambury, St. Albans.</i>
1910	d	Viereck, Johannes, <i>c/o Wm. Klöpper, Rudlings, markstr 9, Hamburg, Germany.</i>
1905	p	Vigor, Harold D., 196, <i>Mackenzie-road, Beckenham, Kent.</i>
1885		Vincent, Frederick J., A.I.A., <i>c/o Pearl Assurance Co., Ltd., Adelaide-bldgs., London Bridge, E.C.</i>
1904		Vinter, James O., J.P., <i>Southfield, Trumpington, Cambs.</i>

Year of Election.		
1902		Wacha, Dinsha Edulji, 84, <i>Hornby-road, Fort, Bombay.</i>
1904		Wagner, H. R., <i>Apartado 792, Mexico, D.F.</i>
1900		Walford, Adolphus A. B. (<i>Frank Brown & Co.</i>), <i>Finkle Chambers, Stockton-on-Tees.</i>
1890	d	Walford, Ernest L., 47, <i>Hamilton-terrace, N.W.</i>
1909		*Walker, James, F.C.R.A., “ <i>Cuthkin View</i> ,” <i>Mount Vernon, by Glasgow.</i>
1904	d	Wall, Walter W., 4, <i>Bradgate-road, Catford, S.E.</i>
1905		Wallis, B. Cotterell, F.C.P., B.Sc. (Econ.), <i>Trevelyan, Holdenhurst-av., North Finchley, N.</i>
1868		Wallis, Charles J., 16, <i>Penwerris-terrace, Falmouth.</i>
1880	d	Wallis, E. White, <i>Cannons-lane, Pinner, Middlesex.</i>
1908	d	Wallis, Percy, <i>Westacre, Kettering.</i>
1904		*Walsh, Correa M., <i>Bellport, Long Island, New York, U.S.A.</i>
1910		Walsh, Robert, F.C.A., 67, <i>High-street, Belfast.</i>
1893		Ward, William C., F.S.I.A., 113, <i>Pitt-street, Sydney, N.S.W.</i>
1865		Waterhouse, Edwin. A.I.A., F.C.A., 3, <i>Frederick-place, Old Jewry, E.C.</i>
1892		Wates, Charles M., 49, <i>The Pryors, Hampstead, N.W.</i>
1902	c d	WATSON, ALFRED W., F.I.A., <i>National Health Insurance Joint Committee, Buckingham Gate, S.W.</i>
1911		Watson, William, <i>Jesmond, Church-lane, Handsworth, Birmingham.</i>
1910		*Watt, James, F.F.A., 24, <i>Rothsay-terrace, Edinburgh.</i>
1908	d p	Webb, Augustus D., B.Sc., 5, <i>St. George's-avenue, Tufnell Park, N.</i>
1911		Webb, C. Morgan, 1, <i>Salisbury-villas, Cambridge.</i>
1888		Webb, Henry B., <i>Holmdale, Dorking.</i>
1904	d	Webb, The Hon. Montagu de Pomeroy, C.I.E., <i>Karachi, India.</i>
1893	d	Weedon, Thornhill, <i>Govt. Statistician, Bryn-Maur, Brisbane.</i>
1873	c	*Welby, The Right Hon. Lord, G.C.B., 11, <i>Stratton-street, Piccadilly, W.</i>
1911		*Wellington, His Grace The Duke of, K.G., G.C.V.O., <i>Apsley House, Piccadilly, W.</i>

Year of Election.		
1889		*Wells-Smith, Henry, F.C.A., <i>Chantrey House, Brookhouse-hill, Fulwood, Sheffield.</i>
1855	<i>c d p</i>	Welton, Thomas A., F.C.A., <i>Ixworth Court, Stanhope-road, Highgate, N.</i>
1902	<i>d</i>	Westall, George, <i>87, Chancery-lane, W.C.</i>
1882		*Whadcoat, John H., F.C.A., <i>Drumstinghall, Dalbeattie.</i>
1878		Wharton, James, <i>Edgehill, Netherhall-yds., Fitzjohn's-av., N.W.</i>
1887		Whimney, Frederick, <i>85, Avenue-road, Regent's Park, N.W.</i>
1859		Whitbread, Samuel, <i>Southill-park, Biggleswade, Beds.</i>
1887		*White, The Rev. George C., M.A., <i>Nursling Rectory, Southampton.</i>
1905		White, Richard, F.C.I.S., <i>Folkestone Chamber of Commerce, Folkestone.</i>
1910		Whitehead, Alfred North, F.R.S., <i>17, Carlyle-square, S.W.</i>
1888	<i>d</i>	Whitehead, Sir James, Bart., J.P., D.L., <i>Wilmington Manor, near Dartford.</i>
1895	<i>d</i>	Whitehead, The Hon. Thomas Henderson, M.L.C., <i>Broadfield, Buntingford, Herts.</i>
1892	<i>c d</i>	Whitelegge, Sir B. Arthur, K.C.B., M.D., <i>12, St. Mary Abbott's-terrace, Kensington, W.</i>
1895		Whittuck, Edward A., M.A., B.C.L., <i>Claverton Manor, Bath.</i>
1899		Wiener, Isidore, <i>Colecroft, Kenley, Surrey.</i>
1898		Wigham, Matthew T., A.S.A.A., F.C.I.S., <i>826, Salisbury House, London Wall, E.C.</i>
1913		Wigram, Ralph F., <i>Mount Sandford, Barnstaple, N. Devon.</i>
1909		Wilbur, Dr. Cressy L., <i>Chief Statistician,</i> <i>Bureau of the Census, Washington, D.C., U.S.A.</i>
1913		Wilkinson, Rev. J. Frome, M.A., F.S.A., <i>Barley Rectory, Royston, Herts.</i>
1901	<i>d</i>	Willcox, Walter F., Ph.D., <i>Cornell University, Ithaca, N.Y., U.S.A.</i>
1896		*Williams, Major C. Woolmer, <i>28, Prebend-mansions, High-road, Chiswick, W.</i>
1897	<i>d</i>	*Williams, Ernest E., <i>Ecclefechan, Lake-road, Wimbledon, S.W.</i>
1904	<i>d</i>	Williams, Frederick A., A.I.A., F.A.S., <i>Apartado 1420, Mexico City, Mexico D.F.</i>
1864		Williams, F. Bessant, F.S.A. (Scot.), 3, <i>Essex-grove, Central Hill, Upper Norwood, S.E.</i>
1888		*Williams, Robert, M.P., <i>20, Birchin-lane, E.C.</i>

Year of Election.		
1909		Williams, Sydney Fairs, 4, <i>South-street, Finsbury, E.C.</i>
1911	p	Williams, T. Taliesin, B.A., <i>Decca College, Decca, Eastern Bengal and Assam.</i>
1911		Willington, Walter Auwyl, <i>Derwen, 172, Hanover-road, Broudesbury Park, N.W.</i>
1895		*Willis, J. G., B.A., C.B., <i>Board of Trade, Whitehall-gardens, S.W.</i>
1891		Wilson, Henry J., <i>Osgathorpe Hills, Sheffield.</i>
1898		Wilson, Herbert W., 203, <i>Elgin-avenue, W.</i>
1884	c	WILSON, SIR JAMES, K.C.S.I., 59, <i>Cadogan-square, S.W.</i>
1909		Wolfe, Lee J., 161, <i>Broadway, New York, U.S.A.</i>
1900	d	Wolfe, S. Herbert, 165, <i>Broadway, New York City, U.S.A.</i>
1897	d p	Wood, George H., <i>Gwyndy, Netherton, Nr. Huddersfield.</i>
1913		Wood, Mrs., 4, <i>Brandon House, Mortimer-street, W.</i>
1897		Woodd, Basil A. H., <i>Abbotsfield, Wiveliscombe, Somerset.</i>
1890		*Woolcombe, Robert L., LL.D., &c., 14, <i>Waterloo-road, Dublin.</i>
1903		Woolley, Ernest, 7, <i>Finch-lane, Cornhill, E.C.</i>
1895		Worsfold, Edward M., F.C.A., <i>Market Square, Dover.</i>
1878		Worsfold, Rev. John N., M.A., <i>Hathelsey, 17, Alexandra-road, Worthing.</i>
1912		Wotzel, A. A., " <i>Bohemia</i> ," <i>Belmont, Surrey.</i>
1906		Wyldbore-Smith, Edmund C., <i>The Foreign Office, S.W.</i>
1868	c d p	Yerburgh, Robert A., M.P., 25, <i>Kensington Gore, S.W.</i>
1900		Yerbury, John E., 3, <i>Queen-street, Cheapside, E.C.</i>
1877		*Youll, John G., <i>Jesmond-road, Newcastle-on-Tyne.</i>

Year of Election.		
1911		Young, Professor Allyn A., <i>Cornell University, Ithaca, New York, U.S.A.</i>
1898		Young, Sydney, <i>The Corn Exchange, Mark-lane, E.C.</i>
1895	<i>c d p</i>	YULE, G. UDNY, M.A. (<i>Hon. Secretary</i>), <i>St. John's College, Cambridge.</i>
1901		Zimmerman, Lawrence W., <i>104, Buckingham-rd., Heaton Moor, Manchester.</i>
1913		Zimmern, Miss Dorothy Margaret, M.A., <i>Oakhill-drive, Surbiton, Surrey.</i>

* * * *The Honorary Secretaries request that any inaccuracy in the foregoing list, and all changes of address, may be notified to the*
ASSISTANT SECRETARY.

HONORARY FELLOWS.

HIS MOST GRACIOUS MAJESTY THE KING,
Patron.

Argentine Republic.

Year of
Election.

1890

d

FRANCISCO LATZINA, Calle Maipu, 982, Buenos Ayres.
Director General of Statistics; Doctor *honoris causa* of the Faculty of Physical and Mathematical Sciences of the University of Córdoba; Knight of the Austrian Order of the Iron Crown; Knight of the Italian Order of S.S. Maurice and Lazare; Officer of the Academy of France; Member of the National Academy of Sciences, of the International Statistical Institute, of the Geographical and Statistical Societies of Paris, of the Society of Commercial Geography of Paris, and Corresponding Member of the National Historical Academy of Venezuela.

Austria.

1911

d

DR. ROBERT MEYER, 1, Schwarzenbergstrasse 5, Vienna.
Privy Councillor, President of the Imperial and Royal Central Statistical Commission, Vienna.

Belgium.

1904

d

EMILE WAXWEILER, Parc Leopold, Brussels.
Director of the Solvay Sociological Institute, Brussels; Professor of Statistics, Economics and Sociology at the University of Brussels; Member of the International Statistical Institute; Member of the Royal Academy of Belgium.

Denmark.

1878

d

VIGAND ANDREAS FALBE-HANSEN, Copenhagen.
Late Director of the Statistical Bureau of the State; late Professor of Political Economy at the University of Copenhagen; Director of the Life and Fire Office "Danmark"; *Doctor Juris*; Life Member of the Upper House of Legislation (Landsting); Knight Commander of the Order of the "Danebrog."

Year of
Election.**Denmark—*Con'd.***

- 1900 *d p* **MARCUS RUBIN, Vendersgade 25a, Copenhagen.**
Knight of the Order of the "Danebrog"; Director-General of Customs and Taxation; late Director of the Statistical Bureau of the State; President of the Danish Society of Political Economy and of the Board of the Danish Society of History; Member of the International Statistical Institute.
- 1907 *d p* **HARALD LUDVIG WESTERGAARD, Seherfigsvej, Copenhagen.**
Professor of Political Economy and Statistics at the University of Copenhagen.

France.

- 1880 *d p* **JACQUES BERTILLOX, M.D., 1, Avenue Victoria, Paris.**
Late Chief of the Statistical Department of the City of Paris; Member of the Superior Council of Statistics; of the Consultative Committee of Public Hygiene of France; Past President of the Statistical Society of Paris; and Member of the International Statistical Institute, &c.
- 1879 *d* **ARTHUR CHERVIN, M.D., 82, Avenue Victor Hugo, Paris, XVI^e.**
Doctor of Medicine and Surgery; Director of the Paris Institute for Stammerers; Past President of the Statistical Society of Paris; Member of the Superior Council of Statistics, &c.
- 1908 *d p* **YVES GUYOT, 95, Rue de Seine, Paris.**
Member of the Superior Council of Statistics; ex-President of the Statistical Society of Paris; ex-Minister of Public Works; Guy Medallist; Hon. Member of the Cobden Club; Vice-President of the Society of Political Economy; Editor of the "Journal des Economistes," &c.
- 1911 *d p* **LUCIEN MARCH, 97, Quai D'Orsay, Paris, France.**
Statistique Générale de la France.
- 1910 *d* **M. EUGÈNE TISSERAND, 17, Rue de Cirque, Paris.**
Corresponding Member of the Academy of Sciences (Institute of France); ex-Councillor of State; Honorary Director of Agriculture; ex-Member of the Superior Council of Statistics; ex-President of the Statistical Society of Paris.
- 1887 **DANIEL WILSON, 2, Avenue d'Jéna, Paris.**
Ex-Under-Secretary of State; Past President of the Statistical Society of Paris.

Year of
Election.**France—Contd.**

- 1876 *d* THE PRESIDENT (for the time being) OF THE STATISTICAL SOCIETY OF PARIS, **28, Rue Serpente Danton, Paris.**

Germany.

- 1896 *d* CARL VICTOR BÖHMERT, **Hospitalstrasse, 4, Dresden.**
Geheimer Regierungsrath; Doctor Juris; Late Director of the Statistical Bureau of Saxony; Professor of Political Economy and Statistics in the Polytechnical High School of Dresden; Member of the International Statistical Institute.
- 1908 *d* RICHARD VAN DER BORGHT, **Kaiseraller, 26, Wilmersdorf-Berlin.**
Dr. *phil.*; Late President of the Imperial Statistical Office; President of the Council for Labour Statistics; Member of the Prussian Central Statistical Commission; Corresponding Member of the Belgian Central Statistical Commission; Member of the International Statistical Institute; formerly Professor of Political Economy at the Technical High School of Aachen.
- 1904 *d* DR. WILHELM LEXIS, **Göttingen.**
Professor of Economics and Statistics at the University of Göttingen; Vice-President of the International Statistical Institute.
- 1877 *d* GEORG VON MAYR, **Georgenstrasse, 38, Munich.**
Ex-Under Secretary of State in the Imperial Ministry for Alsace-Lorraine; formerly Director of the Royal Statistical Bureau of Bavaria; Honorary Member of the International Statistical Institute; Ordinary Professor of Statistics, Finances, and Political Economy at the University of Munich; Associate of the Statistical Society of Paris.
- 1897 *d* ADOLPH WAGNER, Ph.D., **51, Lessingstrasse, Berlin, N.W.**
Professor of Political Economy at the University of Berlin; Member of the Statistical Bureau of Prussia, and of the International Statistical Institute.
- 1876 *d* THE PRESIDENT (for the time being) OF THE GEOGRAPHICAL AND STATISTICAL SOCIETY OF FRANKFORT, **Stadtbibliothek, Frankfurt.**

Hungary.

- 1904 *d* JULIUS DE VARGHA, DR. *JURIS*. **Budapest.**
Director of the Central Statistical Office of Hungary; Member of the Hungarian Academy of Sciences and of the "Society Kisfaludy"; President of the Commission for the preparation of the annual administration report on Hungary; Member of the International Statistical Institute, &c.

Year of
Election.

Italy.

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| 1874 | <i>d</i> | <p>LUIGI BODIO, 153, Via Torino, Rome.
 Senator; Doctor of Laws; Councillor of State; President of the Council of Statistics of the Kingdom; President of the Council of Emigration; President of the International Statistical Institute; Member of the Royal Academy "dei Lincei"; Correspondent of the Institute of France (Academy of Moral and Political Sciences).</p> |
| 1899 | <i>d</i> | <p>CARLO FRANCESCO FERRARIS, Via 20 settembre, 7, Padua.
 Professor of Administrative Science and Law at the Royal University of Padua; Member of the Superior Council of Statistics and of the Superior Council of Public Education of Italy; Member of the Academy "dei Lincei," of the Royal Institute of Science at Venice, of the International Statistical Institute, and Honorary Member of the Swiss Statistical Society; ex-Minister of Public Works; Member of the Italian Parliament.</p> |

Japan.

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| 1910 | <i>d</i> | <p>COUNT Y. YANAGISAWA, 1, Shiba Tamachi, 8 chome, Tokio.
 Member of the House of Peers; Honorary Member of the Bureau of General Statistics, Imperial Cabinet; Honorary Counsellor of Statistical Department of City of Tokio; Member of National Census Committee; late Professor of Statistics at Waseda University; Member of International Statistical Institute; Honorary Member of Statistical Society of Formosa, &c., &c.</p> |
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Netherlands.

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| 1904 | <i>d</i> | <p>C. A. VERRIJN STUART, Professor at the University, Groningen, Holland.
 Professor of Political Economy and Statistics at the University, Groningen; President of the Central Statistical Commission of the Netherlands; Secretary-General of International Statistical Institute; late Director of the Central Statistical Bureau of the Netherlands; Corresponding Member of Statistical Society of Paris; Honorary Member of the Cobden Club.</p> |
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Norway.

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| 1874 | <i>d</i> | <p>ANDERS NICOLAI KLÆR, Christiania.
 Director of the Central Statistical Bureau of Norway; Associate of the Statistical Society of Paris; Member of the International Statistical Institute.</p> |
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Year of
Election

Russia.

- 1890 *d* HIS EXCELLENCY NICOLAS TROÏNITSKY, **Mohovaia 6, St. Petersburg.**
Former Governor; Senator; Acting Privy Councillor; late Director of the Central Statistical Committee of the Ministry of the Interior; President of the Statistical Council. Life Member of the Imperial Geographical Society of Russia, Vice-President of the International Statistical Institute, and Member of the Statistical Society of Paris.

Sweden.

- 1890 *d* ELIS SIDENBLADH., Ph.D., **Stockholm.**
Late Director in Chief of the Central Statistical Bureau of Sweden; late President of the Royal Statistical Commission; Commander, Officer, and Knight of several Swedish and Foreign Orders; Member of the Royal Academies of Sciences and of Agriculture, at Stockholm, of the International Statistical Institute, and Honorary and Corresponding Member of several foreign learned Societies.
- 1909 *d* DR. GUSTAV SUNDBÄRG, **Sibyllagat 72, Stockholm.**
Professor of Statistics; Compiler of the series "Aperçus statistiques internationaux."

Switzerland.

- 1890 LOUIS GUILLAUME, **Bern.**
Doctor of Medicine; Director of the Federal Statistical Bureau; Member of the International Statistical Institute.

Turkey.

- 1911 HIS EXCELLENCY DJAVID BEY, **Minister of Public Works, Constantinople.**

United States.

- 1873 *d* THE HON. WILLIAM BARNES, **The O'Connor-Barnes Homestead, On the Cliff, Nantucket Island, Mass., U.S.A.**
Lawyer; ex-Superintendent of the Insurance Department, State of New York.
- 1896 *d* WORTHINGTON CHAUNCEY FORD, **c/o Massachusetts Historical Society, Boston, Mass., U.S.A.**
Late Chief of the Bureau of Statistics, Treasury Department; late Chief of the Bureau of Statistics, Department of State; Member of the International Statistical Institute.
- 1911 *d* THE PRESIDENT (for the time being) OF THE AMERICAN STATISTICAL ASSOCIATION, **Boston.**

Year of
Election

Tasmania.

- | | | |
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| 1894 | <i>d</i> | ROBERT MACKENZIE JOHNSTON, I.S.O., Hobart.
Registrar-General and Government Statistician; Fellow and Member of Council of the Royal Society of Tasmania; Member of Council and of Senate of the University of Tasmania; Fellow and Past President of Section F (<i>Economics and Statistics</i>) of the Australasian Association for the Advancement of Science; Fellow of the Royal Geographical Society of Australia; Honorary Foreign Corresponding Member of the Geological Society of Edinburgh; Fellow of the Linnean Society of London. |
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Great Britain and Ireland.

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| 1876 | <i>d</i> | THE PRESIDENT (for the time being) OF THE MANCHESTER STATISTICAL SOCIETY, 3, York Street, Manchester. |
| 1876 | <i>d</i> | THE PRESIDENT (for the time being) OF THE STATISTICAL AND SOCIAL INQUIRY SOCIETY OF IRELAND, 35, Molesworth Street, Dublin. |

* * * The Honorary Secretaries request that any inaccuracies in the List of HONORARY FELLOWS, and all changes of address, may be notified to the Assistant Secretary.

ROYAL STATISTICAL SOCIETY.

Copy of Charter.

Victoria, by the Grace of God of the United Kingdom of Great Britain and Ireland Queen, Defender of the Faith.

To all to whom these Presents shall come, Greeting:—

Whereas Our Right trusty and entirely beloved cousin, Henry, Third Marquess of Lansdowne, Knight of the Most Noble Order of the Garter, Charles Babbage, Fellow of the Royal Society, John Elliott Drinkwater, Master of Arts, Henry Hallam, Fellow of the Royal Society, the Reverend Richard Jones, Master of Arts, and others of Our loving subjects, did, in the year One thousand eight hundred and thirty-four, establish a Society to collect, arrange, digest and publish facts, illustrating the condition and prospects of society in its material, social, and moral relations; these facts being for the most part arranged in tabular forms and in accordance with the principles of the numerical method, and the same Society is now called or known by the name of “The Statistical Society.”

And Whereas it has been represented to Us that the same Society has, since its establishment, sedulously pursued such its proposed objects, and by its publications (including those of its transactions), and by promoting the discussion of legislative and other public measures from the statistical point of view, has greatly contributed to the progress of statistical and economical science.

And Whereas distinguished individuals in foreign countries, as well as many eminent British subjects, have availed themselves of the facilities offered by the same Society for communicating important information largely extending statistical knowledge; and the general interest now felt in Statistics has been greatly promoted and fostered by this Society.

And Whereas the same Society has, in aid of its objects, collected a large and valuable library of scientific works and charts, to which fresh accessions are constantly made; and the said Society has hitherto been supported by annual and other subscriptions and contributions to its funds, and has lately acquired leasehold premises in which the business of the said Society is carried on.

And Whereas in order to secure the property of the said Society, to extend its operations, and to give it its due position among the Scientific Institutions of Our kingdom, We have been besought to grant to Sir Rawson William Rawson, Knight Com-

mander of the Most Distinguished Order of St. Michael and St. George, and Companion of the Most Honourable Order of the Bath, and to those who now are Members of the said Society, or who shall from time to time be elected Fellows of the Royal Statistical Society hereby incorporated, Our Royal Charter of Incorporation for the purposes aforesaid.

1. **Now Know Ye** that We, being desirous of encouraging a design so laudable and salutary, of Our especial grace, certain knowledge and mere motion, have willed, granted, and declared and Do by these Presents, for Us, Our heirs and successors, will, grant, and declare that the said Sir Rawson William Rawson, Knight Commander of the Most Distinguished Order of St. Michael and St. George, and Companion of the Most Honourable Order of the Bath, and such other of Our loving subjects as now are Members of the said Society, or shall from time to time be elected Fellows of "The Royal Statistical Society" hereby incorporated according to such regulations or bye laws as shall be hereafter framed or enacted, and their successors, shall for ever hereafter be by virtue of these presents one body politic and corporate, by the name of "**The Royal Statistical Society,**" and for the purposes aforesaid, and by the name aforesaid, shall have perpetual succession and a common seal, with full power and authority to alter, vary, break, and renew the same at their discretion, and by the same name to sue and be sued, implead and be impleaded, answer and be answered, unto and in every Court of Us, Our heirs and successors.

2. **The** Royal Statistical Society, in this Charter hereinafter called "The Society," may, notwithstanding the statutes of mortmain, take, purchase, hold and enjoy to them and their successors a hall, or house, and any such messuages or hereditaments of any tenure as may be necessary, for carrying out the purposes of the Society, but so that the yearly value thereof to be computed at the rack rent which might be gotten for the same at the time of the purchase or other acquisition, and including the site of the said hall, or house, do not exceed in the whole the sum of Two thousand pounds.

3. **There** shall be a Council of the Society, and the said Council and General Meetings of the Fellows to be held in accordance with this Our Charter shall, subject to the provisions of this Our Charter, have entire the management and direction of the concerns of the Society.

4. **There** shall be a President, Vice-Presidents, a Treasurer or Treasurers, and a Secretary or Secretaries of the Society. The Council shall consist of the President, Vice-Presidents, and not

less than twenty Conneillors; and the Treasurer or Treasurers and the Secretary or Secretaries if honorary.

5. **The** several persons who were elected to be the President, Vice-Presidents, and Members of the Council of the Statistical Society at the Annual Meeting held in the month of June, One thousand eight hundred and eighty-six, shall form the first Council of the Society, and shall continue in office until the first Election of officers is made under these presents as hereinafter provided.

6. **General** Meetings of the Fellows of the Society may be held from time to time, and at least one General Meeting shall be held in each year. Every General Meeting may be adjourned, subject to the provisions of the Bye Laws. The following business may be transacted by a General Meeting, viz.:—

- (a.) The Election of the President, Vice-Presidents, Treasurer or Treasurers, Secretary or Secretaries, and other Members of the Council of the Society.
- (b.) The making, repeal, or amendment of Bye Laws.
- (c.) The passing of any proper resolution respecting the affairs of the Society.

7. **Bye Laws** of the Society may be made for the following purposes, and subject to the following conditions, viz.:—

- (a.) For prescribing the qualification and condition of tenure of office of the President; the number, qualifications, functions, and conditions of tenure of office of the Vice-Presidents, Treasurers, Secretaries, and Members of Council, and Officers of the Society; for making regulations with respect to General Meetings and Meetings of the Council and proceedings thereat, and for the election of any persons to be Honorary Fellows or Associates of the Society, and defining their privileges (but such persons, if elected, shall not be Members of the Corporation), and for making regulations respecting the making, repeal and amendment of Bye Laws, and generally for the government of the Society and the management of its property and affairs.
- (b.) The first Bye Laws shall be made at the first General Meeting to be held under these presents, and shall (amongst other things) prescribe the time for holding the first election of officers under these presents.

8. **The** General Meetings and adjourned General Meetings of the Society shall take place (subject to the rules or bye laws of the Society, and to any power of convening or demanding a

Special General Meeting thereby given) at such times and places as may be fixed by the Council.

9. **The** existing rules of the Statistical Society, so far as not inconsistent with these presents, shall be in force as the Bye Laws of the Society until the first Bye Laws to be made under these presents shall come into operation.

10. **Subject** to these presents and the Bye Laws of the Society for the time being, the Council shall have the sole management of the income, funds, and property of the Society, and may manage and superintend all other affairs of the Society, and appoint and dismiss at their pleasure all salaried and other officers, attendants, and servants as they may think fit, and may do all such things as shall appear to them necessary or expedient for giving effect to the objects of the Society.

11. **The** Council shall once in every year present to a General Meeting a report of the proceedings of the Society, together with a statement of the receipts and expenditure, and of the financial position of the Society, and every Fellow of the Society may, at reasonable times to be fixed by the Council, examine the accounts of the Society.

12. **The** Council may, with the approval of a General Meeting, from time to time appoint fit persons to be Trustees of any part of the real or personal property of the Society, and may make or direct any transfer of such property so placed in trust necessary for the purposes of the trust, or may, at their discretion, take in the corporate name of the Society conveyances or transfers of any property capable of being held in that name. Provided that no sale, mortgage, incumbrance, or other disposition of any hereditaments belonging to the Society shall be made unless with the approval of a General Meeting.

13. **No** Rule, Bye Law, Resolution, or other proceeding shall be made or had by the Society, or any meeting thereof, or by the Council, contrary to the general scope or true intent and meaning of this Our Charter, or the laws or statutes of Our Realm, and anything done contrary to this present clause shall be void.

In witness whereof We have caused these Our Letters to be made Patent.

Witness Ourself, at Westminster, the thirty-first day of January, in the fiftieth year of Our Reign.

By Warrant under the Queen's Sign Manual,

L. S.

MUIR MACKENZIE.

ROYAL STATISTICAL SOCIETY.

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6. Do. on Admission may attach F.S.S. to their Names.
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BYE-LAWS OF THE ROYAL STATISTICAL SOCIETY.

Objects of the Society.

1. The objects of the Royal Statistical Society are to collect, arrange, digest and publish facts, illustrating the condition and prospects of society in its material, social and moral relations; these facts being for the most part arranged in tabular forms and in accordance with the principles of the numerical method.

The Society collects new materials, condenses, arranges, and publishes those already existing, whether unpublished or published in diffuse and expensive forms in the English or in any foreign language, and promotes the discussion of legislative and other public measures from the statistical point of view. These discussions form portions of the published Transactions of the Society.

Constitution of the Society.

2. The Society consists of Fellows and Honorary Fellows, elected in the manner hereinafter described.

Number of Fellows and Honorary Fellows.

3. The number of Fellows is unlimited. Foreigners or British subjects of distinction residing out of the United Kingdom may be admitted as Honorary Fellows, of whom the number shall not be more than seventy at any one time.

Proposal of Fellows.

4. Every Candidate for admission as a Fellow of the Society shall be proposed by two or more Fellows, who shall certify from their personal knowledge of him or of his works, that he is a fit person to be admitted a Fellow of the Society. Every such certificate having been read and approved of at a Meeting of the Council, shall be suspended in the office of the Society until the following Ordinary Meeting, at which the vote shall be taken.

Election of Fellows.

5. In the election of Fellows, the votes shall be taken by ballot. No person shall be admitted unless at least sixteen Fellows vote, and unless he have in his favour three-fourths of the Fellows voting.

Admission of Fellows.

6. Every Fellow elect is required to take the earliest opportunity of presenting himself for admission at an Ordinary Meeting of the Society.

The manner of admission shall be thus:—

Immediately after the reading of the minutes, the Fellow elect, having first paid his subscription for the current year or his composition, shall sign the obligation contained in the Fellowship-book, to the effect following:—

"We, who have underwritten our names, do hereby undertake, each for himself, that we will endeavour to further the good of the Royal Statistical Society for improving Statistical Knowledge, and the ends for which the same has been founded; that we will be present at the Meetings of the Society as often as conveniently we can, and that we will keep and fulfil the Bye-laws and Orders of this Society: provided that whensoever any one of us shall make known, by writing under his hand, to the Secretaries for the time being, that he desires to withdraw from the Society, he shall be free thenceforward from this obligation."

Whereon the President, taking him by the hand, shall say,—“By the authority, and in the name of the Royal Statistical Society, I do admit you a Fellow thereof.”

Upon their admission Fellows shall have the right of attaching to their names the letters F.S.S., but not in connection with any trading or business advertisement other than the publication of any book or literary notice.

Admission of Honorary Fellows.

7. There shall be Two Meetings of the Society in the year, on such days as shall be hereafter fixed by the Council, at which Honorary Fellows may be elected.

No Honorary Fellow can be recommended for election but by the Council. At any Meeting of the Council any Member thereof may propose a Foreigner or British subject of distinction residing out of the United Kingdom, delivering

at the same time a written statement of the qualifications of, offices held by, and published works of, the person proposed; and ten days' notice at least shall be given to every Member of the Council, of the day on which the Council will vote by ballot on the question whether they will recommend to the Society the election of the person proposed. No such recommendation to the Society shall be adopted unless at least three-fourths of the votes are in favour thereof.

Notice of the recommendation shall be given from the chair at the Meeting of the Society next preceding that at which the vote shall be taken thereon. No person shall be elected an Honorary Fellow unless sixteen Fellows vote and three-fourths of the Fellows voting be in his favour.

The Council shall have power to elect as Honorary Fellows, the Presidents for the time being of the Statistical Societies of Dublin, Manchester, and Paris, and the President of any other Statistical Society at home or abroad.

Payments by Fellows.

8. Every Fellow of the Society shall pay a yearly subscription of Two Guineas, or may at any time compound for his future yearly payments by paying at once the sum of Twenty Guineas,* or after the payment of twenty-five annual subscriptions the sum of Ten Guineas, unless the Annual Subscription or Composition Fee shall be remitted by the Council; provided that the number of Fellows whose Annual Subscription or Composition Fee shall have been thus remitted, do not exceed five at any one time.

Every person elected to the Society shall pay his first subscription (or if he desire to become a Life Fellow, his composition) within three months, at the latest, of the date of his election, if he be resident in the United Kingdom. If he be resident abroad, this period shall be six months. If payment be not made within the time specified above, the election shall be void.

Defaulters.—Withdrawal of Fellows.

9. All yearly payments are due in

advance on the 1st of January, and if any Fellow of the Society have not paid his subscription before the 1st of July, he shall be applied to in writing by the Secretaries, and if the same be not paid before the 1st of January of the second year, a written application shall again be made by the Secretaries, and the Fellow in arrear shall cease to receive the Society's publications, and shall not be entitled to any of the privileges of the Society until such arrears are paid; and if the subscription be not discharged before the 1st of February of the second year, the name of the Fellow thus in arrear shall be exhibited on a card suspended in the office of the Society; and if, at the next Annual General Meeting, the amount still remain unpaid, the defaulter shall, unless otherwise authorised by the Council, be announced to be no longer a Fellow of the Society, the reason for the same being at the same time assigned. No Fellow of the Society can withdraw his name from the Society's books, unless all arrears be paid; and no resignation will be deemed valid unless a written notice thereof be communicated to the Secretaries. No Fellow shall be entitled to vote at any Meeting of the Society until he shall have paid his subscription for the current year.

Expulsion of Fellows.

10. If any Fellow of the Society, or any Honorary Fellow, shall so demean himself that it would be for the dishonour of the Society that he longer continue to be a Fellow or Honorary Fellow thereof, the Council shall take the matter into consideration; and if the majority of the Members of the Council present at some Meeting (of which and of the matter in hand such Fellow or Honorary Fellow, and every Member of the Council, shall have due notice) shall decide by ballot to recommend that such Fellow or Honorary Fellow be expelled from the Society, the President shall at its next Ordinary Meeting announce to the Society the recommendation of the Council, and at the following Meeting the question shall be decided by ballot, and if at least three-fourths of the

* Cheques should be made payable to "The Royal Statistical Society," and crossed "Messrs. Drummond and Co."

number voting are in favour of the expulsion, the President shall forthwith cancel the name in the Fellowship-book, and shall say,—

“By the authority and in the name of the Royal Statistical Society, I do declare that A. B. (naming him) is no longer a Fellow (or Honorary Fellow) thereof.”

And such Fellow or Honorary Fellow shall thereupon cease to be of the Society.

Trustees.

11. The property of the Society may be vested in three Trustees, chosen by the Fellows. The Trustees are eligible to any other offices in the Society.

President, Council, and Officers.

12. The Council shall consist of a President and thirty Members, together with the Honorary Vice-Presidents.

From the Council shall be chosen four Vice-Presidents, a Treasurer, the Honorary Secretaries, and a Foreign Secretary, who may be one of the Honorary Secretaries. The former Presidents who are continuing Fellows of the Society shall be Honorary Vice-Presidents. Any five of the Council shall be a quorum.

Election of President and Officers.

13. The President, Members of Council, Treasurer, and Honorary and Foreign Secretaries shall be chosen annually by the Fellows at the Annual General Meeting.

The Vice-Presidents shall be chosen annually from the Council by the President.

The President shall not be eligible for the office more than two years in succession.

Six Fellows, at least, who were not of the Council of the previous year, shall be annually elected; and of the Members retiring three at least shall be those who have served longest continuously on the Council, unless they hold office as Treasurer or Honorary or Foreign Secretary.

Nomination of President, Council, and Officers.

14. The Council shall, previously to the Annual General Meeting, nominate, by ballot, the Fellows whom they recommend to be the next President and

Council of the Society. They shall also recommend for election a Treasurer and the Secretaries (in accordance with Rule 12). Notice shall be sent to every Fellow whose residence is known to be within the limits of the metropolitan post, at least a fortnight before the Annual General Meeting, of the names of Fellows recommended by the Council.

Extraordinary Vacancies.

15. On any extraordinary vacancy occurring of the Office of President, or other Officer of the Society, the Honorary Secretaries shall summon the Council with as little delay as possible, and a majority of the Council, thereupon meeting in their usual place, shall, by ballot, and by a majority of those present, choose a new President, or other Officer of the Society, to be so until the next Annual General Meeting.

Committees.

16. The Council shall have power to appoint Committees of Fellows and also an Executive Committee of their own body. The Committees shall report their proceedings to the Council. No report shall be communicated to the Society except by the Council.

Auditors.

17. At the first Ordinary Meeting of each year, the Fellows shall choose two Fellows, not being Members of the Council, as Auditors, who, with one of the Council, chosen by the Council, shall audit the Treasurer's accounts for the past year, and report thereon to the Society, which report shall be presented at the Ordinary Meeting in February. The Auditors shall be empowered to examine into the particulars of all expenditure of the funds of the Society, and may report their opinion upon any part of it.

Meetings Ordinary and General.

18. The Ordinary Meetings of the Society shall be held monthly, or oftener, during the Session, which shall be from the 1st of November to the 1st of July in each year, both inclusive, on such days and at such hours as the Council shall declare. The Annual General Meeting shall be held on such day in the month of June of each year as shall be appointed by the Council for the time being.

Business of Ordinary Meetings.

19. The business of the Ordinary Meetings shall be to elect and admit Fellows, to read and hear reports, letters, and papers on subjects interesting to the Society. Nothing relating to the bye-laws or management of the Society shall be discussed at the Ordinary Meetings, except that the Auditors' Report shall be presented at the Ordinary Meeting in February, and that the Minutes of the Annual General Meeting, and of every Special General Meeting, shall be submitted for confirmation at the next Ordinary Meeting after the day of such Annual or Special General Meeting. Strangers may be introduced to the Ordinary Meetings, by any Fellow, with the leave of the President, Vice-President, or other Fellow presiding at the Meeting.

Business of Annual General Meeting.

20. The business of the Annual General Meeting shall be to elect the Officers of the Society, and to discuss questions on its bye-laws and management. No Fellow or Honorary Fellow shall be proposed at the Annual General Meeting. No Fellow shall propose any alteration of the rules or bye-laws of the Society at the Annual General Meeting, unless after three weeks' notice thereof given in writing to the Council, but amendments to any motion may be brought forward without notice, so that they relate to the same subject as the motion. The Council shall give fourteen days' notice to every Fellow of all questions of which such notice shall have been given to them.

Special General Meetings.

21. The Council may, at any time, call a Special General Meeting of the Society when it appears to them necessary. Any twenty Fellows may require a Special General Meeting to be called, by notice in writing signed by them, delivered to one of the Secretaries, specifying the questions to be moved. The Council shall, within one week of such notice, appoint a day for such Special General Meeting, and shall give at least one week's notice of every Special General Meeting, and of the questions to be moved, to every Fellow

within the limits of the metropolitan post, whose residence is known. No business shall be brought forward at any Special General Meeting other than that specified in the notice convening the same.

Duties of the President.

22. The President shall preside at all Meetings of the Society, Council, and Committees which he shall attend, and in case of an equality of votes, shall have a second or casting vote. He shall sign all diplomas of admission of Honorary Fellows. He shall admit and expel Fellows and Honorary Fellows, according to the bye-laws of the Society.

Duties of the Treasurer.

23. The Treasurer shall receive all moneys due to, and pay all moneys owing by, the Society, and shall keep an account of his receipts and payments. No sum exceeding Ten Pounds shall be paid but by order of the Council, excepting always any lawful demand for rates or taxes. The Treasurer shall invest the moneys of the Society in such manner as the Council shall from time to time direct.

Duties of the Honorary Secretaries.

24. The Honorary Secretaries shall, under the control of the Council, conduct the correspondence of the Society; they or one of them shall attend all Meetings of the Society and Council, and shall duly record the Minutes of the Proceedings. They shall issue the requisite notices, and read such papers to the Society as the Council may direct.

Powers of the Vice-Presidents.

25. A Vice-President, whether Honorary or nominated, in the chair, shall act with the power of the President in presiding and voting at any Meeting of the Society or Council, and in admitting Fellows; but no Vice-President shall be empowered to sign diplomas of admission of Honorary Fellows, or to expel Fellows or Honorary Fellows. In the absence of the President and Vice-Presidents, any Member of Council may be called upon by the Fellows then present, to preside at an Ordinary or Council Meeting, with the same power as a Vice-President.

Powers of the Council.

26. The Council shall have control over the papers and funds of the Society, and may, as they shall see fit, direct the publication of papers and the expenditure of the funds, in accordance with the provisions of the Charter.

27. The Council shall be empowered at any time to frame Regulations not inconsistent with these bye-laws, which shall be and remain in force until the next Annual General Meeting, at which they shall be either affirmed or annulled; but no Council shall have power to renew Regulations which have once been disapproved at an Annual General Meeting.

28. The Council shall have the custody of the Common Seal. The Common Seal shall not be affixed to any instrument, deed, or other document, except by order of the Council and in the presence of at least two Members

of the Council and in accordance with such other regulations as the Council shall from time to time prescribe. The fact of the seal having been so affixed shall be entered on the minutes of the Council.

29. No Dividend, Gift, Division, or Bonus in money shall be made by the Society, unto or between any of the Fellows or Members, except as hereinafter provided.

30. The Council shall publish a Journal of the Transactions of the Society, and such other Statistical Publications as they may determine upon, and may from time to time pay such sums to Editors and their assistants, whether Fellows of the Society or not, as may be deemed advisable.

31. All communications to the Society are the property of the Society, unless the Council allow the right of property to be specially reserved by the Contributors.

REGULATIONS OF THE LIBRARY.

1. The Library and the Reading Room are open daily from 10 a.m. to 7 p.m. during the Session, and in other months from 10 a.m. to 5 p.m., except on Saturdays, when they are closed at 2 p.m.

2. Every Fellow, whose subscription is not in arrear, is entitled to consult books and to use the Reading Room. Persons who are non-Fellows may be allowed to use the Library and Reading Room for a definite period on presentation to the Librarian of an introduction by a Member of Council. All cases in which temporary permission has been granted to non-Fellows shall be reported to the Library Committee at its next meeting. No books may be borrowed except by Fellows.

3. Fellows resident in the United Kingdom may borrow books from the Library on personal application, or by letter addressed to the Assistant Secretary or Librarian, all expenses for carriage being paid by them.

4. No Fellow may have more than ten volumes out at any one time or keep any book longer than one month, except by special authority from the Chairman of the Library Committee or an Honorary Secretary.

5. Cyclopædias, books of reference, and unbound scientific journals and periodicals may be borrowed only on the written order of an Honorary Secretary for a period not exceeding *four days*. If books so lent be not returned within the specified time, the borrower shall incur a fine of one shilling per day per volume for each day they are detained beyond the time specified.

6. Any Fellow who damages or loses a book, shall either replace the work or pay a fine equivalent to its value.

7. Readers are not themselves to replace books taken from the shelves, but to lay them on the Library table.

8 Any infringement of these regulations will involve the suspension of the right to the use of the Library, and shall be reported to the Library Committee at its next meeting.

DONORS TO THE LIBRARY.

DURING THE YEAR 1912-13.

(a) Foreign Countries.

Argentine Republic—

Banco Español del Río de la Plata.

General Statistical Bureau.

Ministry of Agriculture.

Buenos Ayres. Provincial and Municipal Statistical Bureaus.

Cordoba. Provincial Statistical Bureau.

Austria—

Central Statistical Commission.

Ministry of Agriculture.

„ Finance.

„ Public Works.

„ Railways.

Statistical Department of Ministry of Commerce.

Austrian Labour Department.

Bohemia. Statistical Bureau.

Bosnia and Herzegovina. Statistical Bureau.

Vienna. Statistical Bureau.

Trieste. Commercial Museum.

Brünn. Statistical Bureau.

Prague. Statistical Bureau.

Belgium—

Administration of Mines.

Army Medical Department.

Bureau of General Statistics.

Labour Department.

Ministry of Agriculture.

Ministry of Industry and Labour.

Bruges. The Burgomaster.

Brussels. Bureau of Hygiene.

Hasselt. The Burgomaster.

Royal Academy of Sciences.

Institute of Sociology.

Brazil—

Statistical Bureau.

“Brazilian Review,” The Editor.

Bulgaria. Statistical Bureau.

Chile. Central Statistical Bureau.

China. Imperial Maritime Customs.

Colombia. Ministry of Foreign relations.

Costa Rica. Statistical Bureau.

Cuba—

National Library of Cuba.

Chamber of Commerce.

Denmark—

State Statistical Bureau.

Copenhagen. Statistical Bureau.

Political Economy Society.

Egypt—

Department of Public Health.

Director-General of Customs.

„ Post Office.

Statistical Department, Ministry of Finance.

Comité de Conservation des Monuments de l'Art Arabe.

Egypte Contemporaine. The Editor.

Public Debt Office.

France—

Chief of General Statistics of France.

Director-General of Customs.

Director of the Mint.

Labour Department.

Colonial Office.

During the Year 1912-13—Contd.(a) **Foreign Countries—Contd.***France—Contd.*

Ministry of Agriculture.
 „ Finance.
 „ Justice.
 „ Marine.
 „ Public Works.

Paris—

British Chamber of Commerce.

Statistical Bureau.

Lyons. Silk Merchants' Union.
 Economiste Français, The Editor.

Journal des Economistes, The Editor.

Monde Economique, The Editor.

Polybiblion, Revue Bibliographique Universelle, The Editor.

Réforme Sociale, The Editor.

Rentier, Le, The Editor.

Revue d'Economie Politique, The Editor.

Bank of France.

Statistical Society of Paris.

Germany—

Imperial Health Bureau.

„ Insurance Bureau.

„ Statistical Bureau.

German Consul-General, London.

German Labour Department.

Prussia. Royal Statistical Bureau.

Saxony. Royal Statistical Bureau.

Alsace-Lorraine. Statistical Bureau.

Baden. Statistical Bureau.

Bavaria. Statistical Bureau.

Berlin. Statistical Bureau.

Dresden. Statistical Bureau.

Dusseldorf. Statistical Bureau.

Frankfurt. Statistical Bureau.

Hamburg. Statistical Bureau.

Mannheim. Statistical Bureau.

Munich. Statistical Bureau.

Wiesbaden. Statistical Bureau.

Germany—Contd.

Allgemeines Statistisches Archiv,
 The Editor.

Archiv für Rassen- und Gesellschafts-Biologie, The Editor.

Archiv für Sozialwissenschaft und Sozialpolitik, &c., The Editor.

Jahrbuch für Gesetzgebung, &c., The Editor.

Jahrbücher für Nationalökonomie und Statistik, The Editor.

Zeitschrift für die gesamte Staatswissenschaft, The Editor.

Zeitschrift für Socialwissenschaft, The Editor.

Dresdner. Bank, Berlin.

Geographical and Statistical Society of Frankfurt.

Verein für Versicherungs-Wissenschaft.

Greece—

Ministry of Finance.

Statistical Bureau.

Honduras. Economic Review,
 The Publisher.

Hungary—

Central Statistical Office.

Ministry of Agriculture.

Budapest. Statistical Bureau.

Italy—

Director-General of Agriculture.

„ Customs.

„ Public Health.

„ Statistics.

Labour Department.

Ministry of Finance.

„ Justice.

Florence—

Statistical Bureau.

“Cesare Alfieri” Institute of
 Social Science.

During the Year 1912-13—Contd.(a) **Foreign Countries—Contd.***Italy—Contd.*

Milan. Istituto per le Case
Popolari od Economiche di
Milano.

Palermo. University.

Turin. Statistical Bureau.

Venice. Statistical Bureau.

Economista, The Editor.

Giornale degli Economisti, The
Editor.

Riforma Sociale, The Editor.

Rivista Italiana di Sociologia,
The Editor.

Japan—

Consul-General, London.

Bureau of General Statistics.

Department of Agriculture and
Commerce.

Department of Finance.

Tokyo. Statistical Society.

Liberal News Agency, Tokyo.

Luxemburg. Grand Duchy of.
Statistical Bureau.

Mexico. Statistical Bureau.

Netherlands—

Central Health Bureau.

„ Statistical Bureau.

Ministry of Agriculture, &c.

„ Finance.

„ Interior.

Director-General of Customs.

Amsterdam. Statistical Bureau.

Norway—

Bureau of State Insurance.

Central Statistical Bureau.

Christiania—

Health Department.

Statistical Bureau.

Paraguay. Statistical Bureau.

Portugal. General Statistical Bu-
reau.

Roumania—

Ministry of Agriculture.

„ Finance.

Bucharest. Statistical Bureau.

Russia—

Central Statistical Commission.

Customs Statistical Bureau.

Imperial Russian Financial
Agency.

Ministry of Agriculture.

„ Finance.

Tariff Committee of Russian In-
surance Companies.

Finland—

Statistical Bureau.

Finnlands Hypothekenverein.

St. Petersburg. Statistical Bureau.

Moscow. Statistical Bureau.

Kazan. The University.

Salvador. Statistical Bureau.

Servia. Statistical Bureau.

Spain—

Director-General of Customs.

Geographical and Statistical
Institute.

Madrid. Statistical Bureau.

Sweden—

His Excellency the Swedish
Minister.

Central Statistical Bureau.

Labour Department.

Stockholm—

Health Department.

Statistical Bureau.

Upsala. Royal University.

Switzerland—

Federal Assurance Bureau.

„ Statistical Bureau.

„ Department of Customs.

Régie fédérale des Alcools.

Swiss Statistical Society.

During the Year 1912-13—Contd.(a) **Foreign Countries—Contd.***Switzerland—Contd.*

Swiss Union of Commerce and
Industry.

Bern (Canton). Statistical Bu-
reau.

United States—

Bureau of Census.

„ Education.

„ Immigration.

„ Manufactures.

„ the Mint.

„ Navigation.

Carnegie Foundation.

Comptroller of the Currency.

Department of Agriculture.

„ Commerce and
Labour.

Director of Geological Survey.

Interstate Commerce Commis-
sion.

Librarian of Congress.

Naval Observatory.

National Monetary Commis-
sion.

Secretary of the Treasury.

California—

Bureau of Labor Statistics.

State Board of Health.

University of California.

Connecticut—

State Board of Health.

Bureau of Labor Statistics.

Illinois. Bureau of Labor Sta-
tistics.

Indiana. Department of Statis-
tics.

Iowa. Bureau of Labor Sta-
tistics.

Kansas. Bureau of Labor Sta-
tistics.

Maine. Bureau of Labor and
Industrial Statistics.

Maryland. Bureau of Statistics
and Information.

*United States—Contd.**Massachusetts—*

Board of Arbitration.

„ Health, Lunacy, &c.

Bureau of Labor Statistics.

Michigan—

Bureau of Labor Statistics.

Division of Vital Statistics.

Minnesota—

Bureau of Labor Statistics.

Tax Commission.

Missouri. Bureau of Labor Sta-
tistics.

Nebraska. Bureau of Statistics.

New Hampshire. Bureau of Labor
Statistics.

New Jersey. Bureau of Labor
Statistics.

New York. State Library.

„ Department of Labor.

„ State University.

North Carolina. Bureau of Labor
Statistics.

Ohio. Bureau of Labor Statis-
tics.

Pennsylvania. Bureau of In-
dustrial Statistics.

Wisconsin—

Bureau of Labor Statistics.

State Board of Health.

Boston—

Metropolitan Water and
Sewerage Board.

Statistical Bureau.

Social Research Council.

Chicago—

Board of Trade.

University of Chicago Press.

New York City—

Public Library.

Tenement House Department.
Academy of Medicine.

Municipal Reference Library.

Bankers' Magazine, The Editor.

Bradstreet's Journal, The Editor.

During the Year 1912-13—Contd.(a) **Foreign Countries—Contd.***United States—Contd.*

Commercial and Financial Chronicle, The Editor.
 Commercial America, The Editor.
 Journal of Political Economy, The Editor.
 Political Science Quarterly, The Editor.
 Quarterly Journal of Economics, The Editor.
 Yale Review, The Editor.
 Actuarial Society of America.
 American Academy of Political and Social Science.
 American Economic Review.
 American Philosophical Society.
 American Statistical Association.
 Columbia University.
 Commercial Museum, Philadelphia.
 Harvard University.
 Insurance Institute of America.

United States—Contd.

John Crerar Library, Chicago.
 Johns Hopkins University.
 Prudential Insurance Company of America.
 Russell Sage Foundation.
 Smithsonian Institution.
 New York City.
 Yale University Press.

Uruguay—

Statistical Bureau.
Monterideo. Statistical Bureau.

Venezuela. Statistical Bureau.

International—

Agricultural Institute.
 Eugenics Congress
 Federation of Master Cotton Spinners.
 Statistical Institute.

(b) **India, and Colonial Possessions.***India, British—*

Secretary of State in Council.
 Chief Inspector of Mines.
 Director-General of Commercial Intelligence.
 Geological Survey.
 Lieutenant-Governor of Bengal.
 General Malaria Committee.
 Pasteur Institute of India.
Bengal. The Collector of Customs.
Punjab. Under Secretary to Government.
 Sanitary Commission for Punjab.
 East India Railway Co.
 Indian Engineering, The Editor.

Australia, Commonwealth of—

Bureau of Census and Statistics.
 The Commonwealth Statistician.
 High Commissioner.

Canada—

Auditor-General.
 Census and Statistics Office.
 Clerk, House of Commons.
 Minister of Labour.
 Commissioner of Customs.
 Department of Agriculture.
 Finance Department.
 High Commissioner, London.
 Emigration Office, London.
Alberta. Provincial Government.
British Columbia. Department of Mines.
Ontario—
 Bureau of Industries.
 Department of Agriculture.
Manitoba. King's Printer.
Saskatchewan. Department of Agriculture.
 Royal Society of Canada.

During the Year 1912-13—Contd.(b) **India, and Colonial Possessions—Contd.***Canada—Contd.*

Royal Bank of Canada.

Ceylon—

Ceylon Government.

Registrar-General.

Superintendent of Census.

Jamaica. Registrar-General.*Mauritius—*

Colonial Secretary.

Census Commissioner.

New South Wales—

Bureau of Statistics.

Agent-General, London.

Controller-General of Prisons.

Government Statistician.

Registrar of Friendly Societies.

Railway Commissioners, Sydney.

New Zealand—

Registrar-General.

Registrar of Friendly Societies.

High Commissioner.

Insurance Department.

Old Age Pension Department.

Labour Department.

New Zealand Institute.

Trade Review, The Editor.

Wellington. Harbour Board.

Queensland—

Agent-General, London.

Government Statistician.

Rhodesia—

British South Africa Company.

Chamber of Mines.

Union of South Africa.—

Director of Census.

Union of South Africa—Contd.

Department of Commerce and Industries.

South Australia—

The Chief Secretary.

Government Statist.

Public Actuary.

Public Library.

Straits Settlements. Government Secretary, Perak.

Tasmania—

Government Railways Department.

Government Statistician.

Royal Society of Tasmania.

Transvaal—

Agricultural Department.

Department of Mines.

Government Mining Engineer.

Johannesburg—

Chamber of Mines.

Chamber of Commerce.

Pretoria. Chamber of Commerce.

Victoria—

Agent-General, London.

Government Statistician.

Mines Department.

Registrar for Friendly Societies.

Public Library, &c., Melbourne.

Western Australia—

Agent-General, London.

Government Actuary.

Department of Mines.

Registrar of Friendly Societies.

Registrar-General and Government Statistician.

*During the Year 1912-13—Contd.***(c) United Kingdom and its several Divisions.***United Kingdom—*

Admiralty Medical Department.
 Army Medical Department.
 Army Veterinary Service, The
 Director-General.
 Board of Agriculture and
 Fisheries.
 Board of Trade.
 British Museum.
 Census Office.
 Census of Production Office.
 Colonial Office.
 Companies in Liquidation, In-
 spector-General.
 Crown Agents for Colonies.
 Customs, Commissioners.
 Ecclesiastical Commissioners.
 Factories and Workshops, Chief
 Inspector.
 Foreign Office.
 Friendly Societies, Chief Regis-
 trar.
 Home Office.
 India Office.
 Inland Revenue, The Commis-
 sioners.
 Inspector-General in Bankruptcy.
 Joint Stock Companies, The
 Registrar.
 Local Government Board.
 Royal Commission on Mines.
 " Poor Laws.
 Royal Mint.
 War Office.
 Woods, Forests, &c., Commis-
 sioners.

England—

Census Office.
 Registrar-General of England.
 London County Council.
 " County Council Educa-
 tion Committee.

England—Contd.

London University.
 Metropolitan Asylums Board.
 " Water Board.
 Battersea Metropolitan Borough.
 Wandsworth Borough Council.
 Birmingham City Treasurer.
 Liverpool Mersey Docks and
 Harbour Board.
 Manchester, City Treasurer.
 Nottingham, City Accountant.
 Paddington Medical Officer of
 Health.
 Poplar Medical Officer of Health.
 Medical Officers of Health of
 the Local Government Board
 and of the following towns:
 Birkenhead, Birmingham,
 Blackburn, Bradford, Bristol,
 Cardiff, Derby, Halifax, Hud-
 dersfield, Leicester, Liverpool,
 Manchester, Newcastle-on-
 Tyne, Newport, Norwich,
 Nottingham, Preston, Salford,
 West Hartlepool, Wigan,
 Wolverhampton.

Ireland—

Census Commissioners.
 Department of Agriculture.
 Registrar-General of Ireland.

Scotland—

Board of Agriculture.
 Education Department.
 Local Government Board.
 Registrar-General, Scotland.
 Edinburgh City Chamberlain.
 " Medical Officer.
 Aberdeen Medical Officer.
 " Sanitary Inspector.
 Glasgow Medical Officer.

*During the Year 1912-13—Contd.***(d) Authors, Publishers, &c.**

Alberti, Mario.	Del Vecchio, Gustavo.
Alcan, Felix.	Denham, E. B.
Allen, George, & Co.	Dick, G. W.
Andersson, Dr. Thor.	Doin & Fils, O.
Areowski, Henryk.	Du Bois, Charles G.
Bachi, Riccardo.	Duclos, Maurice.
Bamber, Lieut.-Col. C. J.	Dudfield, Dr., M.A.
Barriol, Alfred.	Duncker & Humblot.
Baxendine, Andrew.	Eaton, H. W., & Sons.
Bellet, Daniel.	Edgeworth, Prof. F.Y., M.A., F.B.A.
Berger-Levrault & Co.	Effingham Wilson, Ltd.
Bertillon, Dr. J.	Einandi, Signor Luigi.
Black, A. & C.	Ellison & Co.
Bonney, Prof. T. G., F.R.S.	Enke, Ferdinand.
Boutcher, Mortimore, & Co.	Eve, H. Trustram.
Bowes & Bowes.	Falkenburg (Dr. ph.).
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Callie, J. W. S.	Frowde, Henry.
Cambridge University Press.	Gardner, Alexander.
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Chisholm, G. G., M.A.	Goschen'sche, G.J. Verlagshandlung.
Clarendon Press.	Gow, Wilson, & Stanton.
Clarke, Sir Ernest.	Green, W., & Sons.
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Coghlan, T. A., I.S.O.	Guillaume, Dr.
Colin, Librairie Armand.	Guyot, Yves.
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Cotta'sche, Buchhandlung, J. G.	Heymanns, Carl, Verlag.
Craigie, Major, C.B.	Hinckes, Ralph T.
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| James, A. F. Brodie. | Oxford University Press. |
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| Johns Hopkins Press. | Passy, Louis. |
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| Murray, John. | Snow, Dr., E. C. |
| Müssig, Emil. | Societa Editrice Libraria. |

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Stechele, Johann.	Walter, A., F.R.A.S.
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Vandenhoeck & Ruprecht.	Williams & Norgate.
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Verney, Sir Harry, M.P.	Yule, G. Udny, M.A.
Vivian, Younger & Bond.	Zahnbrecher, Dr. Franz.
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(e) Societies, &c. (British).

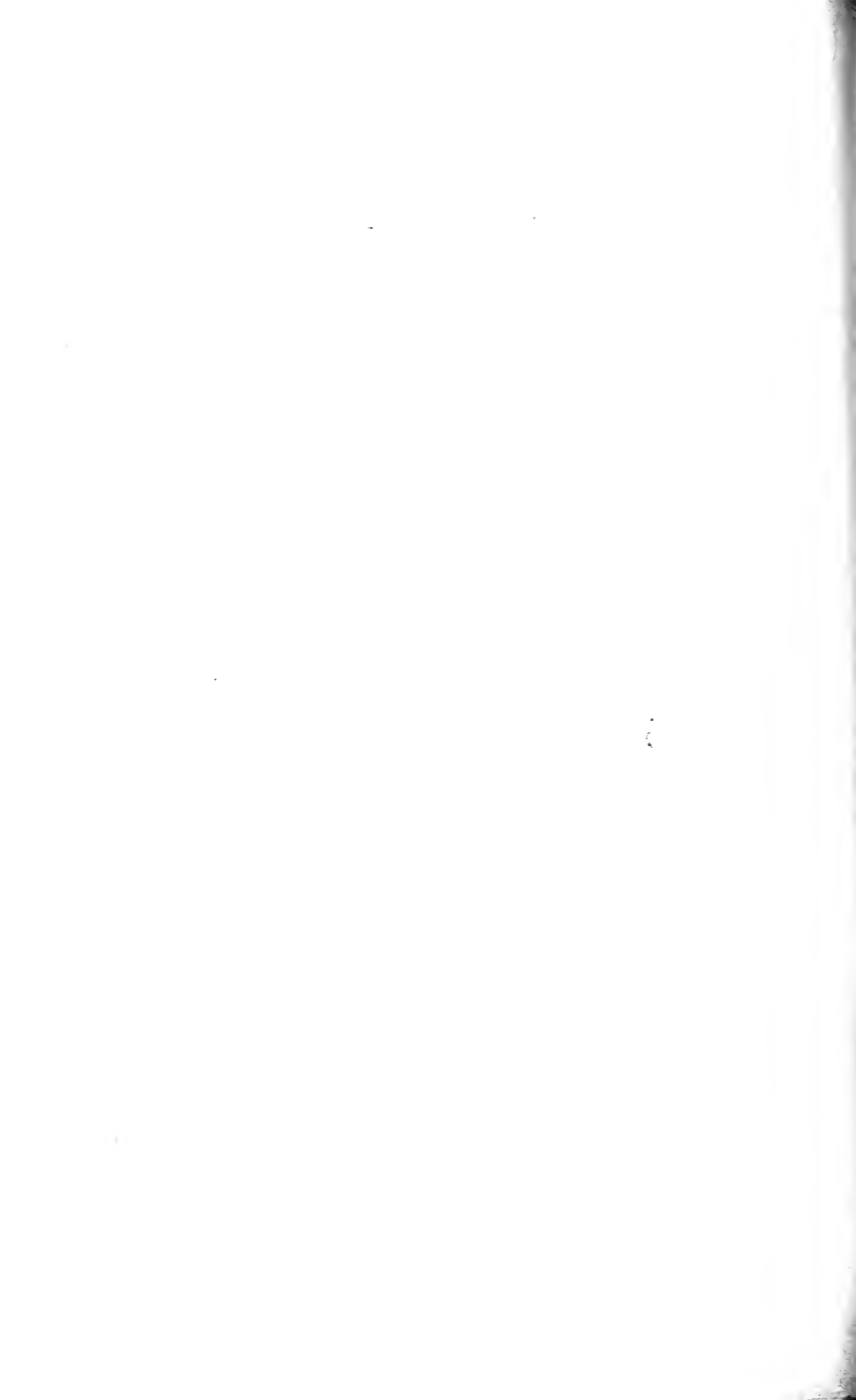
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Incorporated Accountants' Society.	„ United Service Institution.
	Sanitary Institute of Great Britain.
	Society of Comparative Legislation.

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Sociological Society.	United Patternmakers' Association.
Statistical and Social Inquiry Society of Ireland.	United Society of Boilermakers & Iron Shipbuilders.
Stock Exchange.	University College, London.
Surveyors' Institution.	Women's Industrial Council.

(f) **Periodicals, &c. (British). The Editors of—**

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Athenæum.	Investors' Monthly Manual.
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